US Army Corps
of Engineers
Little Rock District

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RED RIVER WATERSHED

DIERKS LAKE

SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA AND PERFORMANCE REPORT

OCTOBER 1987

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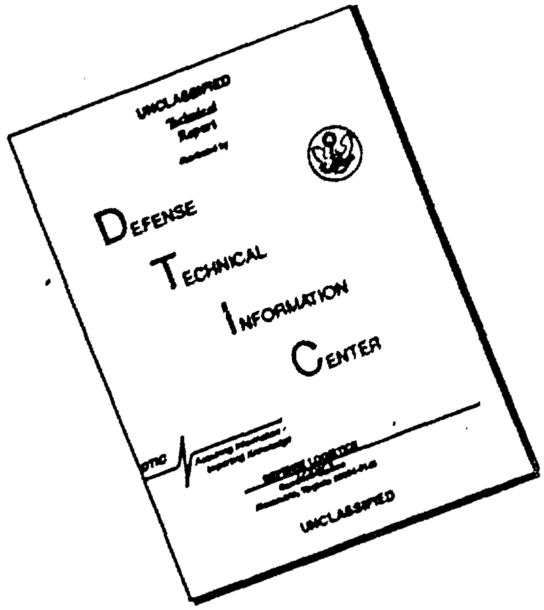

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This report provides a summary record of significant design, construction and operational data on the Dierks Dam and Reservoir. It was prepared in accordance with ER 1110-2-1901, "Embankment Criteria and Performance Report," and is for use by engineers to familiarize themselves with the project, reevaluate the embankment when needed, and for guidance in design of comparable future projects. The report presents a general description of the foundation conditions, type of material and placement methods of the various sections of the embankment, the design considerations on stability and seepage control, significant operational events, and an evaluation of the condition of the embankment. Pertinent drawings, design and construction data, and photos are also included. Dierks Dam is located on the Saline River in Sevier and Howard Counties in southwest Arkansas. The dam consists of a 1,830 feet long main earth embankment rising a maximum of 153 feet above the riverbed and a 670 feet long right embankment. Other major features include an uncontrolled spillway and an outlet works consisting of a 6 feet by 9 feet oblong concrete conduit. The purpose of the project is flood control, water supply, recreation, and fish and wildlife conservation.

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SALINE RIVER, ARKANSAS

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DIERKS DAM AND RESERVOIR
SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA AND PERFORMANCE REPORT

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DIERKS DAM AND RESERVOIR
SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA AND PERFORMANCE REPORT

PERTINENT DATA

LOCATION

Saline River mile 56.5, a tributary of the Little River, in Sevier and Howard Counties, Arkansas.

AUTHORITY

Authorized by the Flood Control Act of 3 July 1958

TYPE OF PROJECT

Rockfill dam with compacted-impervious earth core, uncontrolled spillway, outlet works, and supporting facilities.

DRAINAGE AREA

114 square miles

ELEVATIONS, AREAS AND STORAGES

Feature	Elevation (feet,m.s.l.)	Area (Acres)	Storage (Acre-feet)	Storage (inches)
Top of Dam	593.0	-	-	-
Maximum pool	587.9	5,400	221,600	36.45
Spillway crest	575.0	4,260	159,500	26.23
Top flood control pool	557.5	2,970	96,800	15.92
Top conservation pool	526.0	1,360	29,700	4.88
Top inactive pool	512.0	810	14,600	2.40
Flood control storage	526.0-557.5	-	67,100	11.04
Water supply storage	512.0-526.0	-	15,100	2.48
50-year pool	564.5	3,440	119,100	19.59

SPILLWAY DESIGN FLOOD

Peak flow into full pool	210,000 c.f.s
Volume in full pool	206,900 acre-feet
Total runoff	34.03 inches
Peak flow, natural	202,000 c.f.s.
Reservoir operational channel capacity	1,000 c.f.s.

PERTINENT DATA (Cont.)

HYDRAULIC DESIGN DATA

Spillway	
Discharge at maximum pool	102,000 c.f.s.
Design head	12.9 feet
Outlet works	
Discharge at maximum pool	2,640 c.f.s.
Discharge at top of flood control pool	2,370 c.f.s.
Discharge at top of conservation pool	1,980 c.f.s.
Low flow discharge at bottom of conservation pool	140 c.f.s.

STRUCTURES

Main dam	
Type	Rockfill with impervious earth core
Height	
Maximum above streambed	153 feet
Average above valley floor	119 feet
Crest width	32 feet
Roadway width	24 feet
Length (main dam)	1,830 feet
Length (right embankment)	670 feet
Height (right embankment)	113 feet
Crest elevation	593 feet, m.s.l.
Spillway	
Type	Uncontrolled
Location	Right Abutment
Width	780 feet
Crest elevation	575 feet, m.s.l.
Outlet works	
Type	Oblong conduit
Size	6 feet by 9 feet
Control	2-service, 2-emergency 3'-3" x 8'-0" hydraulic slide gates

1. INTRODUCTION

1.1 Purpose and Scope of Report. This report provides a summary record of significant design, construction and operational data on the Dierks Dam and Reservoir. It was prepared in accordance with ER 1110-2-1901, "Embankment Criteria and Performance Report," dated 31 December 1981 and is for use by engineers to familiarize themselves with the project, reevaluate the embankment when needed, and for guidance in design of comparable future projects. This report was prepared jointly by Grimes & Johnson, Inc. and Grubbs, Garner & Hoskyn, Inc., for the Soils and Materials Section, Little Rock District, under the provisions of Contract No. DACW38-86-D-0070, Delivery Order No. 0007.

The report presents a general description of the foundation conditions, type of material and placement methods of the various sections of the embankment, the design considerations on stability and seepage control, significant operational events, and an evaluation of the condition of the embankment. Pertinent drawings. design and construction data, and photos are also included. More detailed descriptions of the foundation conditions are contained in the Dierks Dam foundation reports: Part I - "Embankment Foundation Grouting," dated April 1974, and Part III - "Embankment Foundation and Spillway," dated September 1978.

1.2 Brief Description and Purpose of Project. Dierks Dam is located at river mile 56.5 of the Saline River in Sevier and Howard Counties in west-central Arkansas, a tributary of Little River. The dam and reservoir are located about 5 miles northwest of the town of Dierks and about 66 miles north of Texarkana, Arkansas.

The major structures include a 780-foot-wide uncontrolled spillway with weir crest at elevation 575.0, a 670-foot-long right embankment located in a saddle between the spillway and the hill forming the right abutment of the main embankment, a 1,830-foot-long main embankment rising to a maximum of 153 feet above the riverbed, and an outlet works consisting of a 6-foot by 9-foot oblong reinforced concrete conduit controlled by two service and two emergency hydraulically operated slide gates. Other structures consist of an administration and maintenance building, paint and oil storage building,

gasoline pump and storage facilities, vehicle parking area, and public overlook facilities.

The purpose of the project is flood control and other beneficial public uses, which include water supply, recreation and fish and wildlife. The recreation area, operated and maintained by the Corps of Engineers, provides facilities year-round.

1.3 Project Authorization. The Dierks Dam and Reservoir project was authorized by the Flood Control Act approved 3 July 1958 (Public Law 85-500, 85th Congress, 2d Session). Related legislation included (a) House Document No. 170, the report "Millwood Reservoir and Alternate Reservoirs, Little River, Oklahoma and Arkansas," and (b) Public Law 87-88, which concerns requirements of local cooperation by State or local interests with regard to the water supply features of the project.

1.4 Project Construction History. Construction was initiated on the right and left abutment access roads in June 1968 and completed in March 1972. Construction of the main embankment, outlet works, spillway and project buildings was initiated in June 1970 and completed in July 1975. The maximum pool of record occurred on December 5, 1982, and reached elevation 558.0 NGVD.

A summary of construction contracts for the entire project is contained on the following page.

LIST OF PROJECT CONTRACTS

CONTRACT NO.	CONSTRUCTION FEATURE	CONTRACT AMOUNT	START DATE	COMPLETION DATE
DACW56-68-C-0235	Left Abutment Access Road	$ 582,985	29 May 68	1 Mar 72
Contractor: E. W. Blair, Inc., P.O. Box 450, Broken Bow, OK				
DACW56-70-C-0159	Embankment, Outlet Works, Spillway & Project Buildings	$ 7,915,460	19 June 70	11 July 75
Contractor: Amis Construction Co., P. O. Box 1871, Oklahoma City, OK 73104				
DACW56-74-0066	Landscaping of Project Bldg. Area	$ 19,636	19 Oct 73	18 Dec 74
Contractor: Green Country Landscaping, P. O. Box 605, Muskogee, OK				
DACW56-75-C-0080	Public Use Areas Stage I, Roads and Parking	$ 255,323	28 Feb 75	1 Mar 76
Contractor: AAA Excavating Company, 800 Arch Street, Little Rock, AR 72201				
DACW56-75-C-0196	Public Use Areas Stage I, Jefferson Ridge & Blue Ridge	$ 572,527	May 75	Feb 76
Contractor: W. R. Austin Const. Co., P. O. Box 998, Shawnee, OK 74801				
DACW56-76-C-0092	Public Use Areas Downstream Horseshoe Bend	$ 300,000	10 Jan 76	27 Oct 76
Contractor: LaForge & Budd Const. Co., P. O. Box 883, Parsons, KS 67357				

1.5 Periodic Inspections. In accordance with the requirements for periodic inspection and continuing evaluation of completed civil works structures, the following reports have been published for periodic inspections performed on the embankment, spillway and outlet works at Dierks Dam and Reservoir. They contain the problems developed after construction and instrumentation data.

Periodic Inspection Report No. 1	November 1974
Periodic Inspection Report No. 2	February 1976
Periodic Inspection Report No. 3	June 1977
Periodic Inspection Report No. 4	November 1979
Periodic Inspection Report No. 5	April 1983
Periodic Inspection Report No. 6	March 1985

2. GEOLOGY

2.1 Physiography. Dierks dam is situated on the Athens Plateau, a dissected piedmont belt about 15 miles wide located between the Ouachita Mountain region to the north and the Gulf Coastal Plain to the south. The Saline River, which heads in the Cossatot Mountains to the north, flows southerly across the Ouachita Mountain region to its confluence with Little River about 30 miles downstream from the dam. Drainage in the area features a trellis pattern and is expressed topographically by rugged east-west ridges and valleys. These alternate ridges and valleys are a reflection of the differential erosion of the soft and hard beds that comprise the foundation. Only an occasional gap breaks the continuity of the ridges. The trunk streams or consequent streams, such as the Saline River, presently flow in rather crooked channels nearly coincident with their ancestral courses. The ancestral courses were eroded into relatively soft Cretaceous formations but subsequent erosion removed the Cretaceous, and the streams presently flow on the underlying, upturned Paleozoic strata.

2.2 Overburden. Except for the alluvial material deposited in the flood plain of the Saline River, there is very little overburden. The right (west) abutment supports only the residual clay, sand, and sandstone boulders that can be held in place by vegetation, and the left (east) abutment supports only the residual materials that have accumulated between sandstone outcrops. These deposits range from 2 to 10 feet in thickness and consist of weathered sandstone fragments in a clayey sand matrix. The flood plain alluvium averages about 20 feet in thickness and consists of sandy clay or clayey sand overlying a heterogeneous mixture of weathered sandstone gravels, cobbles, and boulders.

2.3 Geological Formations. Three formations are exposed in the vicinity of the dam. The Stanley shale (Mississippian age), which is about 6,000 feet thick, consists of shale and interbedded sandstone, and outcrops a short distance upstream of the dam. The Jackfork formation (Mississippian age) also about 6,000 feet thick, consists of quartzitic sandstone and shale interbeds, conformably overlies the Stanley, and forms the bedrock for the dam and spillway. The Pike gravel member of the Trinity formation (Cretaceous age) is comprised of gravel, sand, and clay and unconformably overlies the Jackfork

formation. Remnants of this member cap the hills and ridges a short distance south and west of the dam. The Stanley and Jackfork formations, along with the other pre-Cretaceous deposits in the Ouachita Mountain region, have undergone intense lateral compression resulting in a series of anticlinal and synclinal folds. Evidence of this activity can be seen in the area to the north of the dam. At the damsite, the rocks strike northeast-southwest and dip steeply to the south. There is no evidence of any significant faulting within the damsite although jointing is quite prominent in the hard sandstone beds.

2.4 Stratigraphy. The Jackfork formation, which comprises the foundation rock for the dam and the appurtenant structures, is interbedded sandstone, shaly or argillaceous sandstone, and shale. The sandstone is hard to very hard, light gray, highly quartzitic, and forms ridges up to 15 feet wide that strike almost parallel to the dam axis. These ridges run the entire length of the dam. In some places they form the upstream and/or downstream faces of the cutoff trench. The shaly sandstone is hard, gray to dark gray, and includes zones of shaly inclusions and partings. The shale is moderately hard, slightly fissile, dark gray to black, with occasional thin sandstone seams. Joints, frequently lined with crystals of quartz, calcite, or pyrite, were found throughout the formation.

2.5 Foundation Structure. There was no evidence of faulting at the damsite. This absence of faulting can be attributed to the presence of interbeds of shale which can absorb the compressive stresses (crustal shortening) by crumpling and shearing rather than rupturing. The strikes observed in the general area were found to be quite variable, ranging from about North 60° East to North 75° East. The dip of the rock varies from about 50° to 60° to the south. Because of the steep dip, any slight change in the strike of the strata gives an abrupt change in the apparent dip in the geologic sections. Investigation of the Jackfork sandstone outcrops at the damsite revealed three joint sets. The principal set strikes about North 80° East, which is slightly oblique to the strike of the rock, and dips 50° to 60° to the north. A secondary set strikes roughly North 10° West and dips steeply to the west. The third set, less apparent than the other two, strikes about parallel to the bedding but dips northerly. Jointing in the sandstone beds adjacent to the river valley appears to have been affected by elastic

rebound in that the joints are more open and partially rearranged. Jointing was not prominent in the shale, but numerous slickensided planes found throughout the shales give evidence of some differential adjustments, possibly resulting from past regional tectonic activity.

2.6 Weathering. The foundation rock has been subjected to both chemical and mechanical weathering. The chemical weathering has occurred by both hydration and oxidation. Mechanical weathering, aided slightly by hydration which produces a swelling that widens existing joints and fractures, is evident only at 2- to 3-foot depths. The weathered sandstones are generally moderately hard, tan to rust-brown, with clay-lined, highly stained joints throughout. The weathered shale beds are soft, tan to gray, highly stained, and where highly weathered are sometimes completely altered to clay. The bedrock comprising the abutments at the damsite is chemically weathered to a depth of about 30 feet. Below 30 feet the rock is usually fresh except for staining and minor rock softening adjacent to and on the joint surfaces. Staining, primarily iron oxide, extends considerably deeper in the rock but appears to be negligible below a depth of about 50 to 60 feet. As determined from core borings, the joint staining appears to be the most prominent on the steep right abutment. The rock in the flood plain is fresh except for the top 2 or 3 feet which is very slightly weathered.

2.7 Ground Water. Water occurs in the Jackfork formation in a free state and is replenished by surface runoff and streamflow filtering into the formation through open joints and fractures. The depth of the regional water table was not established. The water table is tributary to the river at both abutments of the main embankment. In the right embankment, artesian flow occurred in several grout holes between stations 2+50 and 3+80 at depths of 28 to 76 feet. In the main embankment, artesian flow was encountered between stations 18+90 and 20+25 at depths of 44 to 82 feet.

2.8 Characteristics of Bedrock. In addition to the bedrock characteristics discussed in the preceding paragraphs, tests were made on a 6-inch rock core taken in the spillway. On the basis of investigations before and during construction, the foundation rock is considered adequate to support the structure.

2.9 <u>Investigations</u>. Tulsa District drilled six site selection borings during January 1964. Later in 1964, and in 1965, and 1966, Fort Worth District completed an additional 67 dam site borings and excavated 14 floodplain test pits for design of the dam, spillway, and outlet works. Nineteen of these borings were drilled along the originally proposed dam axis, and eight were drilled on or adjacent to the design dam axis, including 4 offset borings for exploration of an unexpectedly deep bedrock interval in the floodplain near Boring 169. The initially proposed controlled spillway, located in the deep ravine right of the river, was explored with 12 borings. These borings were drilled and a trench was excavated to bedrock in the design spillway. Two of these borings were drilled inclined 35 degrees from horizontal and normal to bedding dip. Overburden was sampled with an auger and/or Denison core barrel. Where the overburden could not be sampled due to gravelly and cobbly material, the interval was penetrated with a rock bit. Test pits were dug to provide soil samples and to determine top of rock, where practicable. Hydraulic pressure tests were conducted in all NX-size borings, except boring 2C-20 and a few shallow holes along the axis of the outlet works. Electric logs were made in selected borings to aid in correlation of bedrock strata. Surface mapping was done to determine dip and strike of strata, joint patterns, rock type, and rock conditions in outcrops and along the shallow trench excavated in the design spillway. After 1966, 61 additional holes were drilled, making a total of 141 borings. The majority of the additional holes were drilled in the spillway-quarry area. The plans of borings for structures, spillway and borrow areas are given on Plates 10 and 12. Geologic sections with borings and water levels are shown on Plates 12 through 17. Logs of overburden borings and test pits are shown on Plates 5 through 11.

3. FOUNDATION AND ABUTMENT TREATMENT

3.1 Design Considerations.

3.1.1 Embankment. All overburden and loose, weathered material were removed from the embankment areas, and a cutoff trench excavated to firm rock in the abutments. In a few instances, where deeper weathering was encountered, the excavation was planned to stop at 10 feet below the rock line, in order to remove all severely weathered material to a satisfactory foundation. The upstream slope of the cutoff trench coincided with the downstream dip of the rock. The downstream slope was planned as a 4 on 1 slope, but final slopes adjusted during construction to conform to other geologic structures such as jointing. The proposed alignment of the trench crossed various beds of sandstones and shales due to the divergence between the dam axis and strike of the rock. The cutoff trench alignment was adjusted during construction, as limits of the impervious zone permitted, to take advantage of the strike and dip of the rocks. A grout curtain was constructed along the entire bottom length of the cutoff trench by means of grout holes inclined upstream and drilled on a minimum of ten-foot centers. The degree of angle was controlled so as to intersect the downstream dipping bedding plane, normally. It was believed this plane would control the greatest amount of grout movement and/or communication.

3.1.2 Spillway. The spillway contains generally the same bedrock distribution and conditions as the embankment foundation, as it is essentially on the strike of the formations. The excavation, though curved, is essentially across the strike, with the rocks dipping in a downstream, southerly, direction. The side slopes in the spillway were presplit 10V on 1H with two 10-foot berms. Since the spillway excavation cuts across the strike, the resulting side slope and dip of rock relation are favorable for stability. Due to the orientation of the rock, controlled blasting and machine trimming methods near final grade were required to produce a generally uniform surface. The curved alignments on the approach channel could not be excavated upstream from Hole 23 since the cut paralleled the strike. Downstream from Hole 23, the indicated alignment was followed and the 10-foot berm provided. Spillway details are shown on Plate 22.

3.1.3 Outlet Works.

(a) Foundation Conditions. The interbedded sandstone and shale provides an adequate foundation for the outlet works structure, whereas hard and competent sandstone underlie the gate tower. Unconfined compressive strengths for this sandstone were considered similar to those values for the same rock type at Gillham Dam which ranged from 2,500 psi for alternating shale and sandstone beds to 8,666 psi for a hard, fine-grained sandstone. The foundation grade for the intake structure, upper portion of the cut-and-cover conduit, and stilling basin were in unweathered rock (see Plates 1 and 2). The foundation grade at the axis of the dam and for about the last 200 feet of the downstream end of the conduit approximated the top of rock. Therefore, additional excavation of weathered zones was required to secure a suitable foundation in these zones.

(b) Water Table. The water table along the centerline of the outlet works varied from about elevation 445 at the upstream and downstream ends to about elevation 470 at Station 18+60 (see Plates 5 through 9). Although pump tests were not made, ground water inflow was expected to be moderate, and conventional sump and pump methods were used.

(c) Excavation. The excavation grade along the centerline of the outlet works is shown on Plate 1. The total depth of cut in the overburden and rock along the conduit will vary from about 20 to 32 feet. The maximum cut occurred in the stilling basin area where the foundation grade is 39 feet below the original ground surface. Overburden excavation depths varied from about 7 feet at the intake structure to about 34 feet near the center of the conduit section. Rock excavation depths varied from about 2 feet at the downstream end of the conduit to about 22 feet at the stilling basin end sill. Excavation below grade to firm rock and concrete backfill was performed where top of rock was encountered at a lower elevation. The excavation grade for the intake structure was about 17 feet below the top of rock. Overburden cut slopes of 1V on 3.5H, and rock cut slopes of 4V on 1H were selected.

Control blasting techniques, such as presplitting, smooth blasting, or cushion blasting were used to minimize overbreakage and shattering in the sandstone

and shale. The floor of the excavation broke out unevenly because of the steep dip and interbedded nature of the rock. Hand grading was utilized for the final cleanup and foundation preparation. From inspection of local outcrops it was determined that the shales slake slowly when exposed to air. Consequently, due to the low slaking potential of this compaction type clay shale, and the predominance of sandstone, foundation protection was not required. Permanent excavated slopes for the discharge channel were selected to be 1V on 3.5H through overburden and 2V on 1H through rock with a 5-foot bench at the top of rock.

3.2 Embankment Design.

3.2.1 Main Embankment. A typical section of the main embankment is shown on Plates 1 and 28. The maximum height of the main embankment is 153 feet. The embankment was designed with a 1-foot overbuild to compensate for settlements during reservoir filling. The section is essentially symmetrical, with a central impervious core and with random fill zones flanked by transition material and outer shell zones of rock fill. A 4-foot-thick inclined filter is connected to a horizontal 6-foot thick select-rock drain at the base of the downstream shell. The embankment was designed to make maximum use of the materials from the required excavation of the spillway, supplemented where necessary by borrow materials.

3.2.2 Right Embankment. The typical section for the right embankment is shown on Plate 28. The maximum height of the embankment is 120 feet. The section consists of random fill zones, which were mainly a heterogeneous mixture of all soils from the main embankment foundation excavation, with a centrally-located impervious core. A select rock-fill zone was placed on the upstream random fill to increase stability and to provide slope protection for the embankment. Internal drainage was provided by a 3-foot-thick inclined filter located on the downstream face of the impervious core which connects to a 4-1/2-foot horizontal filter blanket under the downstream random fill shell. The right embankment was designed with a 1-foot overbuild to compensate for settlements during reservoir filling.

4. CONSTRUCTION PROCEDURES

4.1 Embankment Foundation.

4.1.1 Main Embankment.

(a) Soils Description. Profiles of the foundation soils are presented in the sections shown on Plates 5 through 11. These sections indicate that the main embankment overburden consisted of a surface layer of low plasticity silts, sands, and sandy clays; interspersed with small quantities of gravels, cobbles, and boulders. A heterogeneous mixture of gravels, cobbles, and boulders with a silty to clayey matrix underlies the upper sand and clays. The thickness of these deposits ranged from near zero on the abutments to a maximum of about 35 feet at boring 169 in the flood plain. The average depth of materials in the flood plain was about 20 feet.

(b) Treatment. Amis Construction Company of Oklahoma City, Oklahoma, the prime contractor, began clearing the embankment area on 20 August 1970. Beginning 20 September 1970, all overburden materials were removed from the foundation of the main embankment to provide a firm rock-to-rock contact for the rock-fill shell zones. Unsuitable material was hauled to the designated waste area or used to build haul roads. Suitable materials were stockpiled for later use as random fill or filter material or were incorporated into the first stage cofferdam. This excavation was accomplished with the use of 621 and 660 Caterpillar scrapers, 769 Caterpillar tail dumps, D-8 and D-9 Caterpillar dozers, and 988 and 980 Caterpillar loaders. Treatment of the foundation rock was limited to removal of all loose and highly weathered materials by blade cleaning outside the limits of the random fill and impervious core zones. Treatment of the foundation rock within the limits of the random fill and impervious core zones consisted of removing all dirt and other loose and highly weathered material by washing, air jet, or both. All open joints and fractures were cleaned and covered or filled with cement mortar or thick grout. The final excavated surface was protected by layers of unexcavated rock until just prior to final excavation, cleanup, treatment, and fill placement.

4.1.2 Right Embankment.

The depths of the foundation overburden

material under the right embankment were generally shallow, ranging from 1 to 4 feet, and were composed of forest litter underlaid by a heterogeneous residual soil (clay, sand, boulders, etc.). These overburden materials were excavated and wasted. Treatment of the foundation rock under the impervious core and random fill was the same as that for the main embankment impervious core and random fill zones. The foundation rock under the downstream random fill zone was blade cleaned.

4.2 Embankment Foundation Rock.

4.2.1 General. The discussion of rock excavation in this report will be limited to the excavation within the the cutoff trench. Rock excavation by drilling and blasting began on 2 December 1970 in the right embankment. Rock excavation was required from station 0+00 to 2+60 to a depth of 10 feet at centerline. The right abutment of the right embankment (station 0+00 to 2+60) sloped steeply upstream. Thus, to achieve a 10-foot cut along centerline of the cutoff trench, it was necessary to excavate as much as 25 feet of rock along the downstream face. See Photograph No. 1 for a general view of the trench excavation. The rock from station 2+60 to 3+80 was considered fresh and firm. Rock was excavated from station 3+80 to 6+60 to a depth of 6 to 10 feet at centerline. The left abutment of the right embankment (station 3+80 to 6+60) sloped very steeply downstream. This required a 15- to 20-foot cut in the upstream face to achieve the desired 6- to 10-foot cut at centerline. This also produced a very shallow cut on the downstream face. Except for several narrow sandstone ridges, the small mass of rock downstream of the presplit line was insufficient to contain the energy of the presplit shot. Consequently, there was almost no downstream face in the cutoff trench from station 3+80 to 6+60 (see Photograph No. 2). There was no cutoff trench from station 6+60 to 9+00. Rock was excavated from station 9+00 to 12+00 to a depth of 10 feet measured at centerline (see Photographs Nos. 4 and 5). No cutoff trench was constructed from station 12+00 to 20+30. Rock was excavated from station 20+30 to 27+00 to a depth of 6 to 10 feet at centerline (see Photographs Nos. 12 through 18). All explosives used by Amis Construction Company at this project were manufactured by the Atlas Powder Company.

4.2.2 Presplitting. To determine the best method of presplitting the downstream face of the cutoff trench, a test section was designated from

station 21+00 to 24+00. Within this area, from station 21+75 to 22+00, the contractor elected to use Kleen-Kut and E-Cord to compare the results with those obtained by the loading procedure outlined in the contract specifications. Holes 2-1/2 inches in diameter were drilled on 24-inch centers to a depth of 6 feet. The holes from station 21+75 to 22+00 were each loaded with one stick of Kleen-Kut 17 percent (1-1/8-inch by 36-inch) with a cap and E-Cord downline. The holes in the control sections were each loaded with one stick of Giant Gelatin 40 percent (1-1/4-inch by 8-inch) in the bottom and two one-half sticks of Giant Gelatin hung on E-Cord on 12-inch centers above it. All holes were stemmed in the top 3 feet. Results of the test showed no discernable difference in the face produced; therefore, the Contractor continued to use Kleen-Kut because of the ease of loading. Typically, the holes were drilled on 24-inch centers and loaded with a continuous column of Kleen-Kut to within 3 feet of the collar. The remaining 3 feet was stemmed.

Primary or excavation shot holes were 3-1/2 inches in diameter. The hole spacing and loads varied with the lift thickness and competence of the rock. Holes adjacent to the presplit line were loaded with one stick of Power Primer 75 percent (2 inches by 8 inches) in the bottom followed by one or more sticks of Ammodyte 57 percent (2-1/2 inches by 16 inches). The amount of stemming in holes less than 8 feet deep ranged from 2 feet to 4 feet. In the deeper holes the depth of stemming approximately equaled the shorter dimension of the hole spacing. Generally, the shallower holes were spaced 4 feet by 6 feet with the spacing increasing with hole depth to a maximum of 7 feet by 11 feet. The holes toward the center of a shot were usually loaded with one stick of Power Primer in the bottom followed by ammonium nitrate blasting agent in the form of prills. These holes were stemmed in the same manner as the holes loaded with Ammodyte. Total quantities of explosives used for excavation of the cutoff trench are shown in Table 4.2.2.

TABLE 4.2.2

EXPLOSIVES SUMMARY

Trade Name	Quantity
Kleen-Kut (1-1/8 inches by 36 inches) 17 percent	1,028 pounds
Giant Gelatin (1-1/4 inches by 8 inches) 40 percent	223 pounds
Power Primer (2 inches by 8 inches) 75 percent	1,789 pounds
Ammodyte (2-1/2 inches by 16 inches) 57 percent	3,731 pounds
ANFO (ammonium nitrate prills)	9,475 pounds
Primacord	2,112 feet
E-Cord	7,701 feet

4.3 Foundation Preparation.

4.3.1 General. All foundation areas to receive concrete, impervious fill, or random fill required foundation preparation. Subsequent change orders widened the foundation preparation under random fill zones, and in August 1972 the foundation preparation under random zones was limited to the 20 feet immediately upstream and 15 feet immediately downstream of the impervious zone. In those areas where the top of rock was considered to be top of firm rock, foundation preparation directly followed overburden excavation. Where rock excavation was necessary, it was carried to within 1 foot of final grade. The final foundation was achieved by removing the large, loose, weathered rock with a Poclain backhoe and a Caterpillar 966 rubber- tired loader. Then a labor crew removed smaller rock with picks, shovels, and pry bars. Final cleanup was achieved by using compressed air and water jets to blow off the remaining loose material. This final cleanup was timed to immediately precede the placement of concrete or earth fill. Generally, placement followed cleanup by less than 1 hour. The foundation was kept wet after the completion of cleanup until the start of backfilling operations.

4.3.2 Foundation Protection Concrete. Several areas in the foundation required the application of foundation protection concrete. Where open joints or badly weathered thin shale seams occurred, they were cleaned to a depth twice as great as their width. They were then filled with 3/4-inch aggregate concrete and allowed to set before covering with fill. In several areas, large overhangs existed in the downstream

portion of the natural cutoff trench created by the weathering of a shale bed between two more resistant sandstone beds. In one area the overhang was backfilled with foundation protection concrete by forming the open side and filling with high slump 3/4-inch concrete. In another area the overhang was eliminated by ripping and dozing. The overhanging rock was sufficiently jointed to allow its removal in this manner without disturbing the underlying rock.

4.4 Grout Curtain.

4.4.1 Drilling and Grouting. The drilling and grouting was performed by the Judy Company, a subcontractor. The Judy Company began moving equipment to the jobsite on 16 December 1970. Drilling and grouting began on 1 March 1971 and continued to 15 August 1971. Following diversion of the river through the outlet works, drilling and grouting began again on 1 June 1972 and was completed on 29 August 1972. Equipment used is listed in Table 4.4.1. Photograph No. 3 shows grouting operations.

The grout curtain was formed by drilling and grouting a single line of holes, varying in depth from 50 to 100 feet, along the dam axis from station 0+00 to 27+00 (see Plates 39 through 42). Generally, the holes were angled 30° upstream to intersect the maximum number of bedding planes, which were dipping downstream. The primary holes (20-foot centers) were drilled to full depth, washed, pressure tested, and grouted in accordance with the "Stop Grouting, Split Spacing" method. Briefly, this method requires the holes to be drilled to final depth and grouted by stops through a packer set at successively shallower depths. The secondary holes were then located midway between the previously drilled and grouted holes. This split spacing continued until the holes were determined to be tight. Generally, a hole was considered tight if it took less than 0.1 sacks of cement per foot.

TABLE 4.4.1

GROUTING EQUIPMENT

Item	Quantity
Chicago-Pneumatic 600 Air Compressor	1
Gardner-Denver 900 Air Compressor	1
Chicago-Pneumatic Airtrac Drill	1
Gardner-Denver Airtrac Drill	1
Atlas-Copco Airtrac Drill	1
Gardner-Denver Pump, 5'x 3' - 1/2' x 4'	1
Wilden Air Pump, 2-inch	1
Deming Air Pump, 3-inch	1
Trucks, 2-ton	2
Pickups, 1/2-ton	2
Parts Trailer	1
Assorted Valves, Gages, and Hoses	

4.4.2 Difficulties Encountered. There were three areas of the grout curtain which required special treatment.

(a) Area No. 1. The first area occurred between stations 16+75 and 19+00 (see Photograph No. 21 for excavation difficulties). From about station 20+10 to 18+70 the dam axis falls between two of the resistant sandstone ridges which strike almost parallel to the axis. At station 18+70 the axis intersects the toe of the steeply dipping sandstone bed which forms the upstream face of this natural cutoff trench. The dam axis falls on this dip slope face from station 18+70 to 17+25, at which point the top of the dip slope is reached (see Photographs Nos. 23 through 26). It was not practical to drill grout holes in this face; therefore, an overlap section was created. This was done by moving the grout curtain gradually upstream from a point on the centerline at station 16+80 to a point 12 feet upstream at station 17+80. Likewise, the grout curtain was moved gradually downstream from a point on the centerline at station 19+00 to a point 20 feet downstream at station 16+75. This, in effect, created two lines of grouted holes approximately 20 feet apart from station 16+75 to station 17+80 (see Plate 41).

(b) Area No. 2. The second problem occurred between stations 12+30 and 12+80. The slope of the right abutment presented a safety hazard to the drilling operation. The subcontractor proposed to drill and grout this

area with two series of angle holes drilled from stations 12+30 and 12+80. The subcontractor agreed to drill two holes at angles greater than the maximum required by the specifications to assure complete grouting of this area. The proposal was accepted, and seven angle holes, ranging from 10° to 45° and 75 feet to 100 feet, were drilled and grouted (see Plate 40).

(c) Area No. 3. The third area requiring special treatment occurred between stations 6+60 and 9+00. The plans did not require a grout curtain across the hill between the right embankment and the main embankment. However, on the recommendation of the Foundations and Materials Section, Southwestern Division, five holes were drilled on 40-foot centers from stations 6+60 and 9+00. All these holes were tight and no further grouting was deemed necessary in this area.

4.4.3 Conclusions on Grouting Effectiveness. The entire length of the grout curtain for its full depth was pressure grouted to refusal, with a very small quantity of grout lost through surface leaks. In areas where seeps occurred in the foundation downstream of the centerline or artesian flow was encountered during drilling, there was a noticeable relocation of seeps to areas upstream of the grout curtain. This indicates the grout curtain has intercepted ground-water flow. Subsequent high water retained by the cofferdam produced no unusual increase in seepage downstream. These facts indicate that the grout curtain is performing its design function.

4.5 Material Sources

4.5.1 Borrow Materials. Borrow soils for the embankment were obtained from borrow area E located upstream of the axis and from areas located within the limits of the conservation pool and outside of borrow area E, which was a value-engineered proposal to the contract. Borrow area D was used as a source of granular materials for the filter. Borrow area C, which was to be a source of impervious borrow, but was not used. The investigation program and plan of the borrow areas are shown on Plates 10 and 11. Characteristics of soils in borrow area E are contained in the following tabulation:

Soil Type	No. Samples Tested	Average Value	
		Liquid Limit	Percent Fines
CL	8	31	60
ML-CL	3	19	60
ML	4	NP	61
SC	24	27	36
SM, SP	44	NP	33
CH	1	65	88
GC	18	32	17
GM, GP	3	NP	22

4.5.2 Filter Materials. Materials for the filter A were obtained from selective excavation of the main embankment foundation and borrow area D. The materials were then processed to the extent necessary to meet the specifications.

4.5.3 Rockfill and Transition Materials. The rockfill material was obtained from the required spillway and approach channel excavations. Plate 17 defines the geologic quality of the in situ material. The select rock fill was obtained from the better quality, least weathered material and was processed over a 3-inch grizzly to insure drainage of the mass and to remove poor quality materials. The minus-3-inch byproduct of the select rock was used for transition. The random rock fill material came from any of the zones except the most weathered. The original contract documents did not require processing of the random rock fill materials; however, the quality of the excavated material was so poor that the processing over a 3-inch grizzly was required. The minus-3-inch byproduct was then used in the random fill zone of the embankment.

5. CONSTRUCTION CONTROL DATA

5.1 Construction Sequence. The general construction sequence was as outlined below:

(a) Excavated Stage 1 diversion channel and constructed first stage cofferdams. (See Plate 27 for details of first and second stage diversions.)

(b) Constructed outlet works and embankment within first stage cofferdams to the minimum elevations and sections shown on Plate 26.

(c) Completed right embankment except upstream transition and select rock sections prior to beginning second stage construction.

(d) Removed first stage cofferdam and constructed second stage diversion cofferdam.

(e) Constructed second stage cofferdam.

(f) Constructed remainder of main and right embankments.

5.2 Impervious Fill. The specifications required that the impervious material consist of clays having a liquid limit of 25 or greater and a percent fines of not less than 35. In addition, the materials were to be placed at 95 percent or greater of standard density as determined by the Rapid Method of Compaction Control (Water Resources Technical Publication EM No. 26). The moisture content was to be within minus-one and plus-three percentage points of optimum. A summary of control tests performed on the impervious fill materials placed in the embankment and reported in Monthly Summaries in Appendix F is given below.

Parameter	No. Tests	Average	High	Low
% Comp.	203	99.5	106	94
Wf-Wo (%)	203	+ 0.3	+ 3.3	- 1.4
-200 Sieve (%)	46	49	77	21
LL (%)	43	34	64	25

Results of impervious fill density tests are plotted on Plates 18 through 21.

5.3 Random Fill. The specifications required a moisture content of plus or minus three percentage points of optimum and 95 percent of standard density.

Parameter	No. Tests	Average	High	Low
% Comp.	271	96.6	110	94
Wf-Wo (%)	271	- 0.5	+ 3.1	- 3.4

Results of the above tests indicate the design requirements were achieved. The random fill density test results are shown plotted on Plates 17 through 21.

5.4 Design Modifications.

5.4.1 Typical Section. The typical section as shown on Plate 28 is the final section resulting after several modifications were made. The sequence of modifications to the main embankment section is shown on Plate 29.

The original section had an upstream random fill zone 20-feet wide and a downstream random fill zone only 15-feet wide; however, the quality of the rock from the required excavation was so poor that the rockfill zones had to be reduced and the screenings from the random rockfill were absorbed in the enlarged random fill zones.

5.4.2 Filter. The specifications did not require a washing sequence in the production of the filter materials. After some material was produced, it became evident that the material would not function as a high capacity drain. A change order was initiated in which the contractor blended 60 percent of the material from the foundation with 40 percent from borrow area D to reduce the minus-200 material. The horizontal filter thickness below elevation 490.0 in the right embankment was increased from 3 feet to 4.5 feet, and above 490.0 the thickness was reduced to 2 feet. This change was made to increase the capacity of the drain placed prior to the change order.

5.4.3 Select Rockfill. The spillway was excavated by systematic drilling and blasting commencing in February 1971 and completed in May 1974. The required excavation in the spillway was the primary source of rockfill material for the embankment. The fresh, hard, unweathered sandstone was processed to produce select rockfill by removing all minus 3-inch material. The minus 3-inch material was placed in the transition zone. Softer, slightly weathered sandstone meeting specifications for random rockfill was used as quarry run. The portion of the remaining spillway excavation meeting

specifications for random rockfill was used as quarry run. The portion of the remaining spillway excavation meeting specifications was used as random fill. Materials unsuitable for zone placement were wasted or used to construct haul roads.

5.4.4 Placement Quantities. The original design contained 1,890,000 cubic yards of compacted random rockfill, select rockfill, and transition material. As a result of the embankment zoning revisions, the actual quantities placed were as follows:

Select rockfill	328,059 cubic yards
Random rockfill	900,564 cubic yards
Transition material	223,757 cubic yards
Total	1,452,380 cubic yards

5.4.5 Seepage During Construction. As shown on Plates 1 and 27, a random rock fill cofferdam was incorporated into the upstream toe of the main embankment. During construction, the pool rose against the cofferdam and seepage occurred through the cofferdam and emerged downstream across a haul ramp. This cofferdam was part of the second stage diversion as shown on plate 27. As a result of the observed seepage, a modification was made to the main embankment section which consisted of placing a five ft. thick blanket of impervious material on the cofferdam upstream slope.

5.5 Embankment Stability.

5.5.1 Tests and Design Values. Tests were conducted on representative soils in the remolded state. The summary of soil shear strength data and graphical presentations are contained in Appendices B through G. Test results from test fills at Gillham Dam and Dierks Dam were used in determining the unit weights and design shear strengths for the rock fills. The adopted design strengths are shown in the following tabulation:

Adopted Design Data

			Design Strengths					
	Saturated	Submerged	Q		R		S	
Materials	Unit Weight (pcf)	Unit Weight (pcf)	Ø (degrees)	C (tsf)	Ø (degrees)	C (tsf)	Ø (degrees)	C (tsf)
Select rock (1)	135	72.6	39	0	39	0	39	0
Random rock (1)	135	72.6	25	0.4	33	0	33	0
Impervious	125	62.5	10	0.6	14	0.1	27	0
Random fill (1)	125	62.5	12	0.8	15	0.3	30	0
Transition	125	62.5	12	0.8	15	0.3	30	0
Filter	125	62.5	33	0	33	0	33	0

Ø - Angle of internal friction. C - cohesion.
(1) Material assumed to have 40 percent voids and a saturated surface dry unit weight of 105 pcf.

(2) Design shear strengths for the random rock fill zones were based on test results for the minus No. 4 fraction of rock.

(3) Design shear strengths for the random fill zones were based on the assumption that these zones would be entirely shale material. These zones actually contain large percentages of sandstone fines and plus 3/4-inch material. Therefore, the design values are conservative.

5.5.2 Construction Control Record Shear Tests. The following summary contains the results of tests performed as construction control samples from the impervious and random fill zones, with six samples obtained from each zone.

Shear tests on the record samples reflected strengths higher than design values with the exception of the unconsolidated-undrained, Q, strengths which were lower. The consolidated-undrained, R, tests on the random fill record samples have not been completed since testing apparatus of sufficient size to test material containing gravel was not available.

Construction Control Shear Tests

Random Material

		Test Strength		Design Strength	
No. Tests	Type Test	ø Degrees	C t.s.f.	ø Degrees	C t.s.f.
6	Q	6*	0.4	12	0.8
6	S	30	0	30	0

Impervious Material

		Test Strength		Design Strength	
No. Tests	Type Test	ø Degrees	C t.s.f.	ø Degrees	C t.s.f.
6	Q	6	0.6	10	0.6
5	R	17	0.5	14	0.1
5	S	31	0	27	0

*The random materials included minus-3-inch byproduct of the random rock and were less plastic than originally designed. (Ref: Periodic Inspection Report No. 1. November, 1974).

5.5.3 Procedures. The embankments were analyzed for stability using the circle arc and wedge methods under conditions of end of construction, partial pool, sudden drawdown, and steady seepage. The design analyses are presented on Plates 30 through 33 for the right embankment and Plates 34 through 37 for the main embankment. The "Adopted" factors of safety for the

main embankment, per Plates 34 through 37, were computed using the adopted design shear strengths and the revised embankment configuration. This reanalysis refined the original slope stability calculations in view of shear strength values developed from the Gillham and Dierks Dam test fills. The stability of the right embankment was not reanalyzed because the design factors of safety were generally higher than those for the main embankment. In addition to the above circle arc and wedge analyses, the main embankment was analyzed for the end of construction and steady seepage conditions by a procedure outlined in an ASCE paper titled, "Rockfill Design - Carters Dam," by Robeson and Crisp, September 1966. This procedure, which basically utilizes earth pressure theories, was believed to be more applicable to a narrow core rockfill structure than those contained in EM 1110-2-1902. Results of these analyses indicate the embankment will be stable for all design conditions.

5.5.4 Results. The following tabulations indicate the safety factors obtained for the most critical arcs.

Factors of Safety for Right Embankment Stability Analysis

Condition Analyzed	Shear Strength Used	Type of Analysis	Safety Factor Design	Safety Factor Adopted
End of const., downstream (1)	Q	Arc	1.36	N/A
Partial pool	R	Arc	1.51	N/A
Sudden drawdown (2)	R	Arc	1.40	N/A
Steady seepage (3)	R	Arc	1.41	N/A
	S	Arc	1.89	N/A

(1) Results are for downstream slope which is more critical than the upstream slope.

(2) Analysis for drawdown from maximum pool elevation, 587.9, to conservation pool elevation 526.0. The select rock zone was considered to be free draining.

(3) Analysis based on differential head between maximum water surface elevation 587.9, and maximum tailwater elevation 451.0.

Factors of Safety for Main Embankment Stability Analysis

Condition Analyzed	Type of Shear Strength	Type of Analysis	Safety Factor Design	Safety Factor Adopted
End of Construction U.S.	Q	Arc	1.71	1.51
Partial Pool	S,(R+S)/2	Arc	1.40	1.77
Sudden Drawdown	R	Arc	1.03	1.12
Steady Seepage	S,(R+S)/2	Arc	1.37	1.63
End of Construction D.S.	Q	Arc	1.58	1.32

(1) Results are for the downstream slope which is more critical than the upstream slope.

(2) Analysis for drawdown from maximum pool elevation 587.9, to conservation pool elevation 526.0. The select rock zone was considered to be free-draining.

(3) Analysis based on differential head between maximum pool elevation 587.9, and maximum tailwater elevation 457.9.

5.5.5 Conclusion. Based on a comparison of test results of the in-place materials with those used in design, the stability of the structure is considered adequate.

6. INSTRUMENTATION

6.1 Surface Control Monuments. A total of thirty-two (32) embankment surface monuments and seventeen (17) abutment control monuments were established to monitor the embankment movements along eight lines of monuments. The locations of the monuments are shown on Plate 4. Results of alignment and settlement surveys are first reported in the second periodic inspection report. Movements observed were less than .05 feet and were well within the accuracy of the survey techniques used. Subsequent readings through the sixth periodic inspection report (March 1985) indicated decreasing amounts of annual settlement, and insignificant amourts of horizontal movement.

6.2 Conduit Alignment Plugs. A total of sixty-four (64) plugs were installed in the conduit invert, as shown on Plate 24. Damage to several of the plugs occurred during construction and necessitated repair and reestablishment of the initial survey in May 1975. A crack was noted at the crown of the conduit during the second periodic inspection. Monolith joint 13-14 had opened 1/2 inch, but the waterstop was still totally effective. Later periodic inspections indicated minor settlements only and generally satisfactory condition of the conduit. Conduit alignment has not been run since the initial alignment of May 1975 because the gates at the upstream end of the conduit do not seal tight enough to decrease flow of water through the conduit enough to take measurements on the plugs located on both sides of each monolith in the conduit invert.

6.3 Bridge Alignment Plugs. Thirteen (13) alignment plugs were installed on the gate tower and service bridge in June 1976, as shown on Plate 24. The maximum settlement recorded by the sixth periodic inspection was approximately .08 feet at the end of the bridge farthest from the gate tower. The maximum deviation horizontally from a line of sight between centers of abutments is approximately 0.15 inch. Movements of the service bridge are not considered significant.

6.4 Pneumatic Pore Pressure Cells. Fourteen (14) nitrogen-gas-operated pore-pressure transducers were installed in the embankment; however, the instrumentation malfunctioned and is not operating. Since these were installed for the purpose of determining pore pressure buildup in the impervious core

during construction, the loss of the cells does not affect the monitoring or the safety of the structure.

6.5 Carlson Stress Cells. A total of twenty-six (26) Carlson stress cells were installed on or along the conduit as shown on Plate 43. Cell No. 23 did not function at the second periodic inspection. In addition, the readings and resulting analysis of stress conditions strongly suggested that some of the cell data was misunderstood or unreliable. By 1977 all Carlson stress cells had ceased to function.

6.6 Seepage. The quantity of controlled seepage in the main embankment increased from the first periodic inspection to the second. Seepage along the stilling basin walls reported in the first report was stopped by plugging selected drain holes in the upper part of the drop section. An appreciable flow of clear water was noted coming from the right side toe drain. Observations for seepage through the sixth periodic inspection reported no apparent problems from the seepage, though the clear water discharge from the right toe drain continues. Some intermittent wet areas have been noted on the downstream face coincident with a construction phase haul ramp. Significant seepage has not been reported.

Observations of the right embankment continue to note flow in the paved ditches along both abutments and at isolated locations near the base of the downstream slope. The areas are for the most part seasonal and are considered to be due primarily to rainfall infiltration. However, a small area of perennial flow does exist in the right abutment paved ditch.

In summary, periodic inspections have indicated that seepage flow rates are negligible and reflect a non-changing condition. Continued monitoring is recommended.

6.7 Inspection Schedule. The schedule for monitoring this instrumentation is contained in the "Operation and Maintenance Manual" dated January 1987.

APPENDIX A

PHOTOGRAPHS

DIERKS DAM AND RESERVOIR
SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA AND PERFORMANCE REPORT

APPENDIX A - PHOTOGRAPHS

Page No.	Photo. No. and Description
A-1	Photo. No. 1. Cut-off trench in the rt. embankment from sta. 0+00 to 5+00. Skid-mounted grout pump is located in the ravine between the truck and the compressor. Note excavation of the u/s face on the dip slope. 28 Apr 71
A-1	Photo. No. 2. Cut-off trench in rt. embankment from sta. 4+00 to 6+00. Note absence of a d/s face. 14 Jun 71
A-2	Photo. No. 3. Grout pump used on this contract. Mixing tank is being charged. The mixed grout is emptied into the holding tank to be pumped into the grout holes.
A-2	Photo. No. 4. Cut-off trench in the main embankment from sta. 9+00 to 11+50. Grout lines are being layed in the foreground. 10 Sep 71
A-3	Photo. No. 5. C. O. T. from sta. 12+40 to 11+00 u/s face is excavated on the dip slope. 26 Jan 73
A-3	Photo. No. 6. Cut-off trench from sta. 19+50 to 23+00. The deep hole in foreground occurred as a result of stream erosion. 27 Sep 71
A-4	Photo. No. 7. D/s face of cut-off trench from sta. 19+50 to 19+70. Face is very irregular as a result of differential erosion. 4 Oct 71
A-4	Photo. No. 8. Overall view of d/s face of C. O. T. from sta. 19+50 to 19+70. 4 Oct 71
A-5	Photo. No. 9. U/s (dip slope) face of C. O. T. from sta. 19+00 to 19+25. 4 Oct 71
A-5	Photo. No. 10. View along center line of C. O. T. from sta. 19+00 to 19+25. Note alluvial fill behind skip box. 14 Oct 71
A-6	Photo. No. 11. Overhang in d/s face of C. O. T. at sta. 19+00 being cleaned prior to backfilling with concrete. 21 Oct 71
A-6	Photo. No. 12. Typical view of the cut-off trench from sta. 20+30 to 21+50. Note dip slope face u/s and absence of d/s face. 7 Oct 71
A-7	Photo. No. 13. D/s portion of the C. O. T. from sta. 21+25 to 22+00. Note presplit holes in the remaining portion of the d/s face. 13 Nov 71
A-7	Photo. No. 14. C. O. T. from sta. 21+00 to 23+00. Note grout hole casings along center line. 13 Nov 71

APPENDIX A - PHOTOGRAPHS
(continued)

Page No.	Photo. No. and Description
A-8	Photo. No. 15. C. O. T. from sta. 22+50 to 23+50. A deeper cut at center line results in a better defined d/s face. Note grout hole casings along centerline. 26 Jan 72
A-8	Photo. No. 16. Typical view of C. O. T. from sta. 23+00 to 24+50. 3 Feb 72
A-9	Photo. No. 17. Typical view of C. O. T. from sta. 24+50 to 27+00. 10 May 72
A-9	Photo. No. 18. Dozer excavating shot rock from cut-off trench in vicinity of sta. 26+00. 12 May 71
A-10	Photo. No. 19. Clean-up of foundation along center line, sta. 18+00 to 14+50. Note dozer working in weathered shale seam on the left. 13 Apr 72
A-10	Photo. No. 20. Excavation of overburden and foundation clean-up for impervious and downstream random zones. Note depth of weathered shale seam. 13 Apr 72
A-11	Photo. No. 21. Clean-up of foundation for upstream random fill zone near sta. 17+50 to 18+50. Note overhand in downstream face. 17 Apr 72
A-11	Photo. No. 22. D-9 Ripper removing rock overhang under upstream random fill zone near sta. 17+50. 19 Apr 72
A-12	Photo. No. 23. Overall view of main embankment C. O. T. Foreground showns C. O. T. from sta. 9+50 to 11+00 right center of photo shows the natural C. O. T. 26 May 72
A-12	Photo. No. 24. Foundation along center line from sta. 16+00 to 18+00. The upper line of grout holes in the overlap section occurs where the men are standing. 4 Aug 72
A-13	Photo. No. 25. Natural C. O. T. from sta. 18+00 to 19+00. Note overhang to be removed in d/s face also the lower line of grout holes in the overlap section occurs in this area. 27 Jul 72
A-13	Photo. No. 26. Overall view of the center line form sta. 15+00 to 18+50. Center line in the foreground falls in the water in the lower left corner. Centerline in the background fall under the dozer. 4 Aug 72
A-14	Photo. No. 27. Damsite, looking toward left abutment. Dec 70
A-15	Photo. No. 28. Construction of outlet works, looking downstream. Jul 71
A-16	Photo. No. 29. Construction of outlet works and embankment, looking downstream. Mar 72
A-17	Photo. No. 30. Main embankment construction, looking toward left abutment. Jul 72

APPENDIX A - PHOTOGRAPHS
(continued)

Photo. No. 1

4-28-71
Cut-off trench in the rt. embankment from sta 0+00 to 5+00. Skid-mounted grout pump is located in the ravine between the truck and the compressor. Note excavation of the u/s face on the dip slope.

Photo. No. 2

6-14-71
Cut-off trench in rt. embankment from sta. 4+00 to 6+00. Note absence of a d/s face.

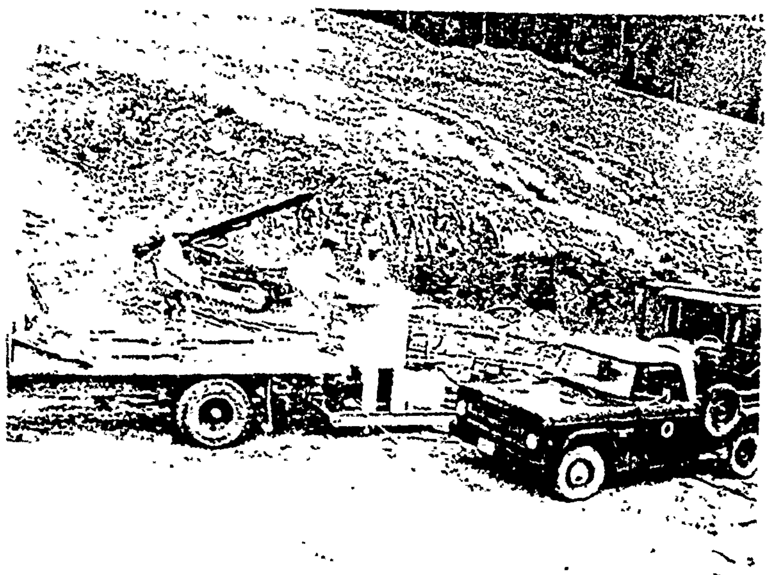
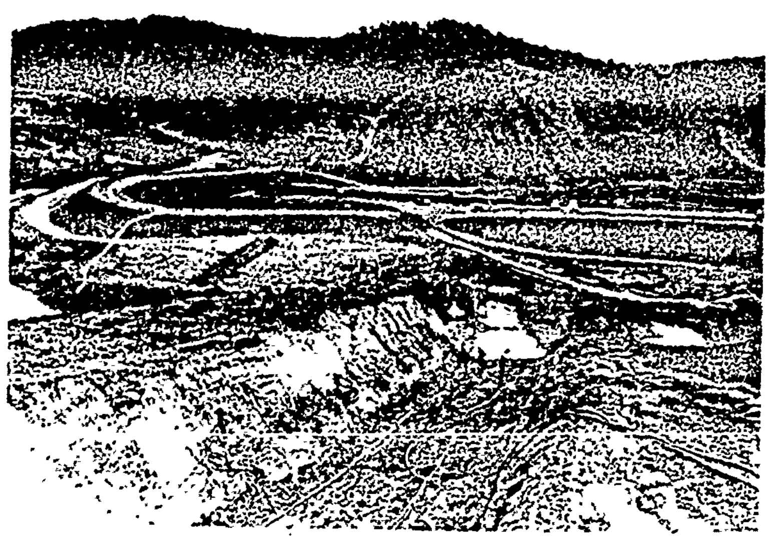


Photo. No. 3
Grout pump used on this contract. Mixing tank is being charged. The mixed grout is emptied into the holding tank to be pumped into the grout holes.



9-10-71 Photo. No. 4
Cut-off trench in the main embankment from sta 9+00 to 11+50.. Grout lines are being layed in the foreground.

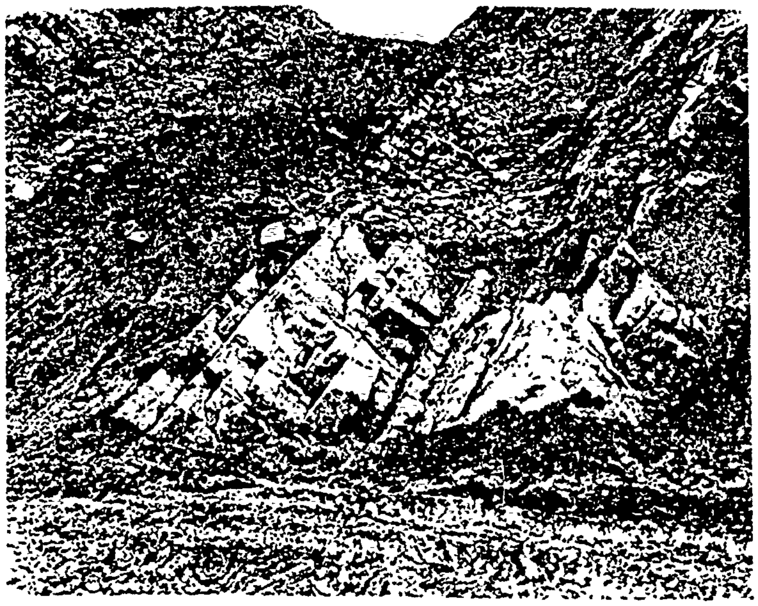


Photo. No. 5

1-26-73
C. O. T. from sta 12+40 to 11+00 u/s face is excavated on the dip slope.

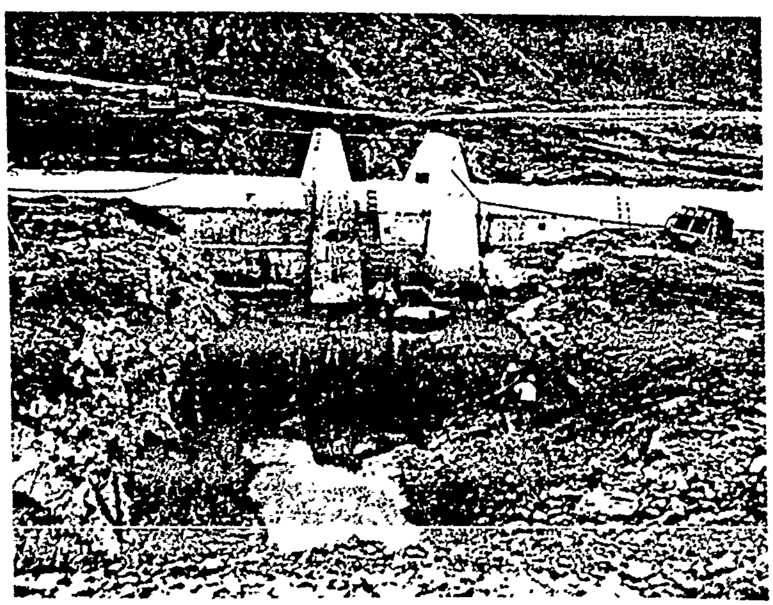


Photo. No. 6

9-27-71
Cut-off trench from sta 19+50 to 23+00. The deep hole in foreground occurred as a result of stream erosion.

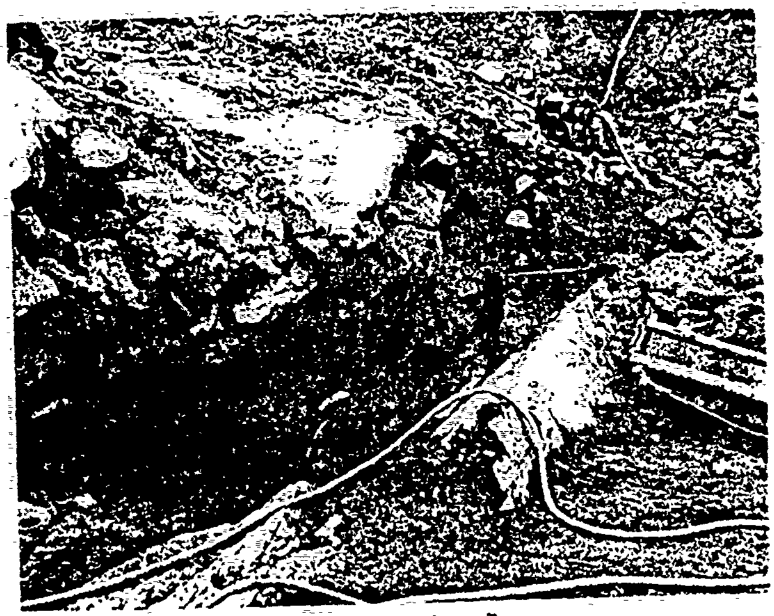


Photo. No. 7

10-4-71
D/s face of cut-off trench from sta 19+50 to 19+70. Face is very irregular as a result of differential erosion.

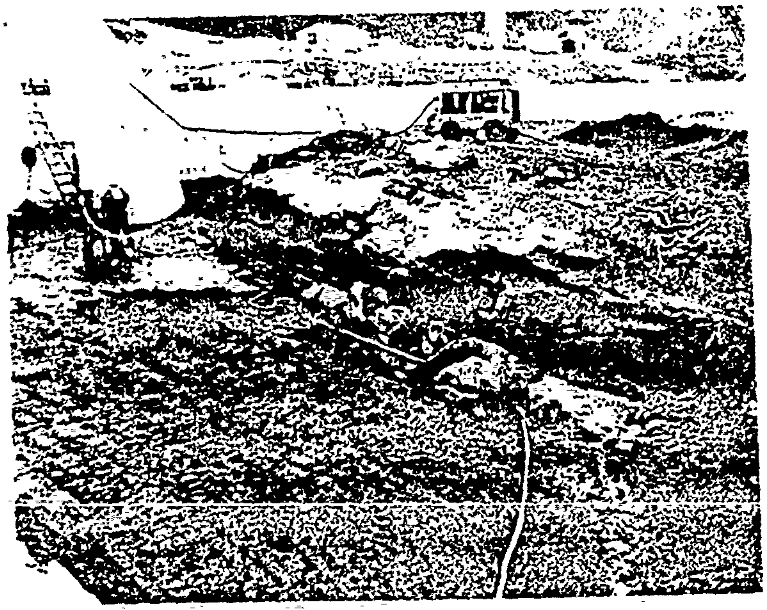


Photo. No. 8

10-4-71
Overall view of d/s face of C.O.T. from sta 19+50 to 19+70.

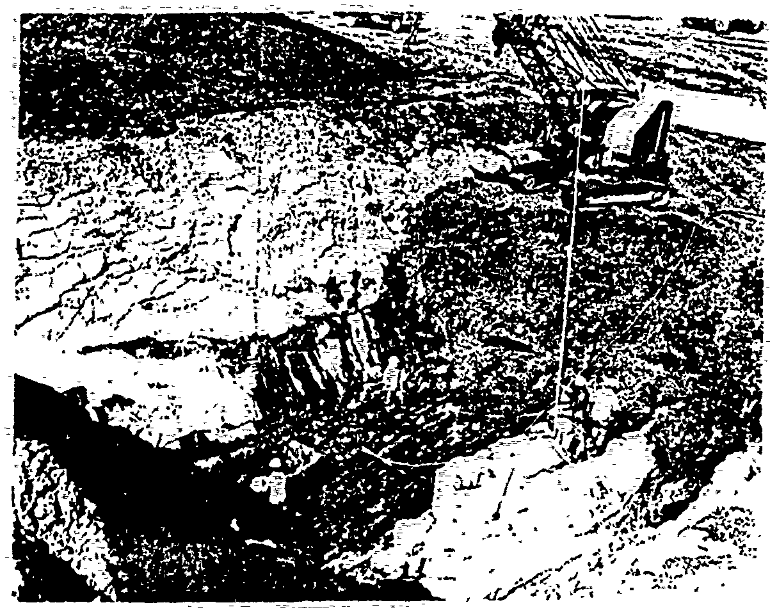


Photo No. 9

10-4-71
U/s (dip slope) face of C.O.T. from sta 19+00 to 19+25.

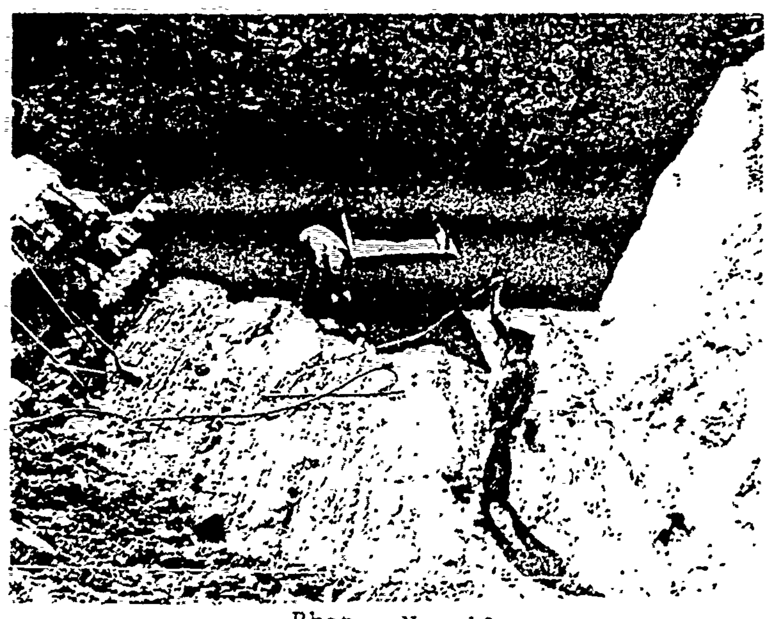


Photo. No. 10

10-14-71
View along center line of C.O.T. from sta 19+00 to 19+25.
Note alluvial fill behind skip box.

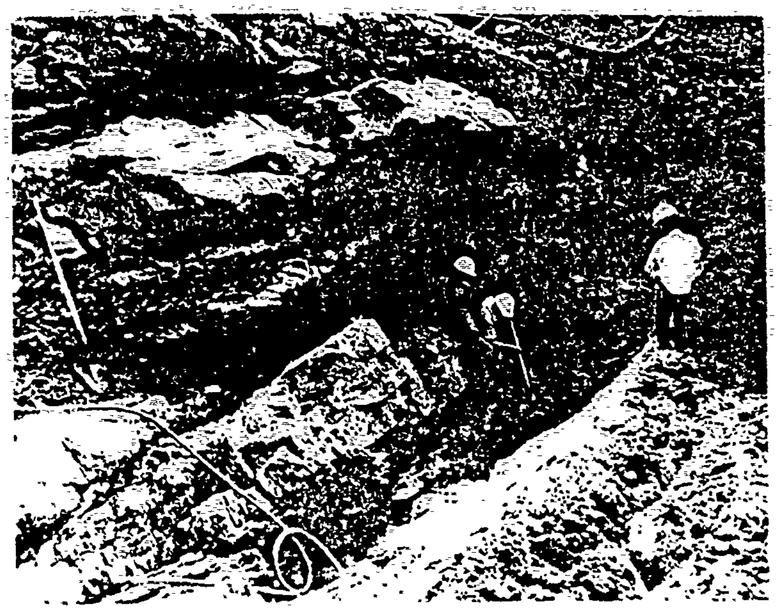


Photo. No. 11

10-21-71
Overhang in d/s face of C.O.T. at sta 19+00 being cleaned prior to backfilling with concrete.

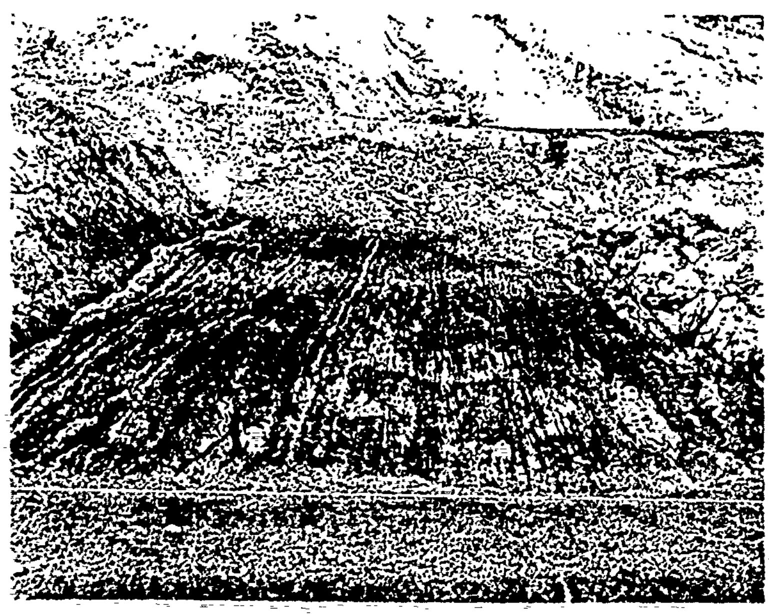


Photo. No. 12

10-7-71
Typical view of the cut-off trench from sta 20+30 to 21+50. Note dip slope face u/s and absence of d/s face.

Photo. No. 13

11-13-71
D/s portion of the C.O.T. from sta 21+25 to 22+00. Note presplit holes in the remaining portion of the d/s face.

Photo. No. 14

11-13-71
C.O.T. from sta 21+00 to 23+00. Note grout hole casings along center line.

Photo. No. 15

1-26-72
C.O.T. from sta 22+50 to 23+50. A deeper cut at center line results in a better defined d/s face. Note grout hole casings along centerline.

Photo. No. 16

2-3-72
Typical view of C.O.T. from sta 23+00 to 24+50.

Photo. No. 17

5-10-72
Typical view of C.O.T. from sta 24+50 to 27+00.

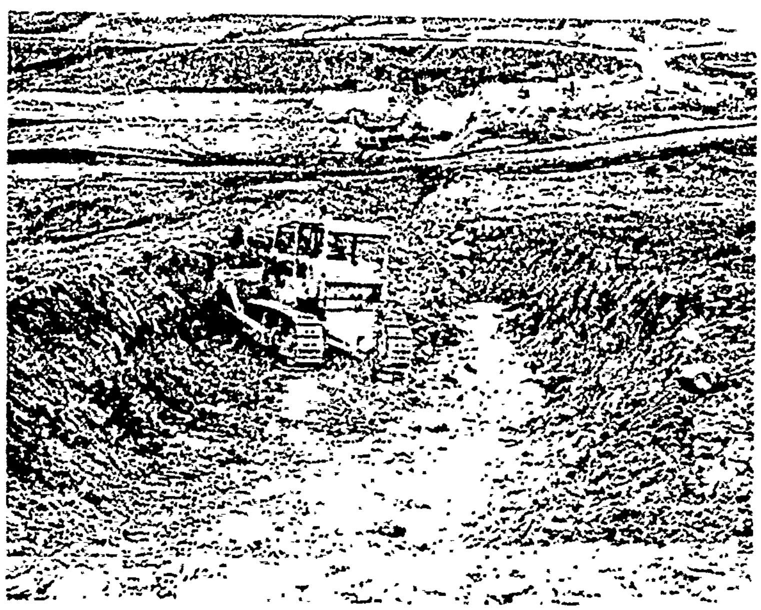


Photo No. 18

5-12-71
Dozer excavating shot rock from cut-off trench in vicinity of sta 26+30.

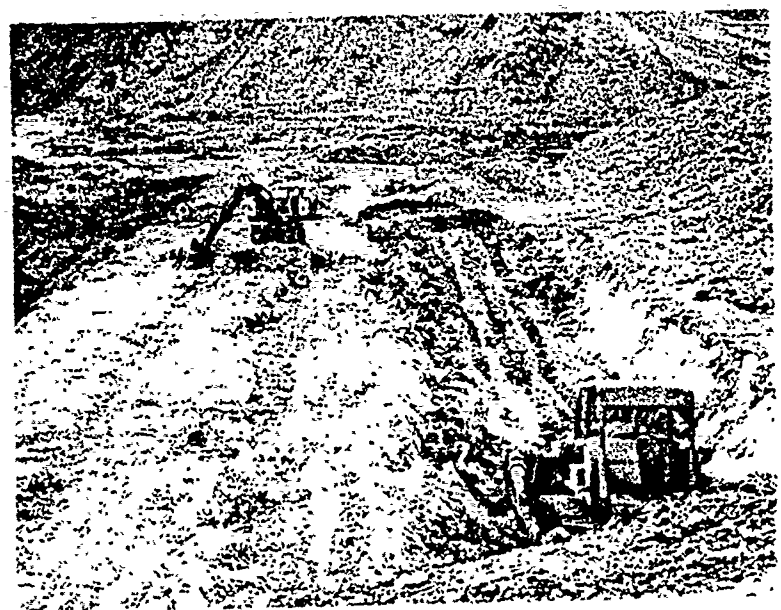


Photo. No. 19

4-13-72
Clean-up of foundation along center line, sta 18+00 to 14+50.
Note deror working in weathered shale seam on the left.

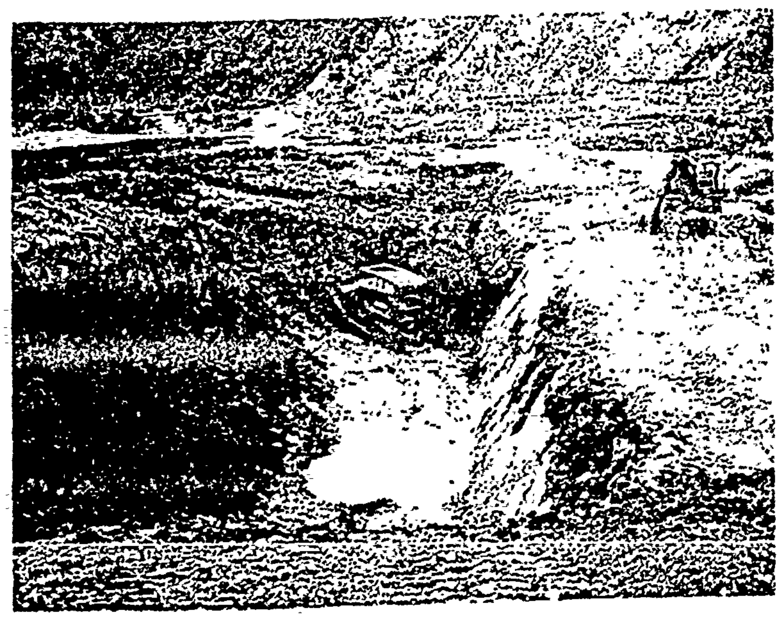


Photo. No. 20

4-13-72
Excavation of overburden and foundation clean-up for impervious and downstream random zones. Note depth of weathered shale seam.

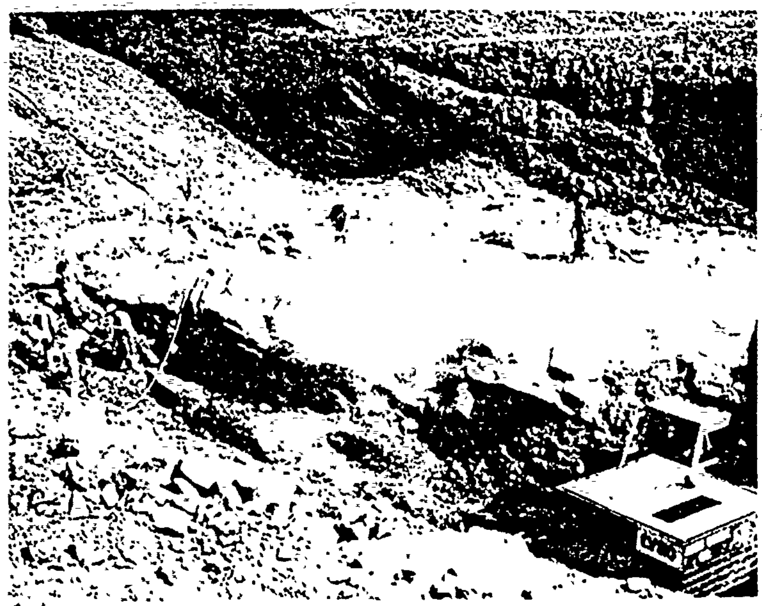


Photo. No 21

4-17-72
Clean-up of foundation for upstream random fill zone, near sta 17+50 to 18+50. Note overhang in downstream face.

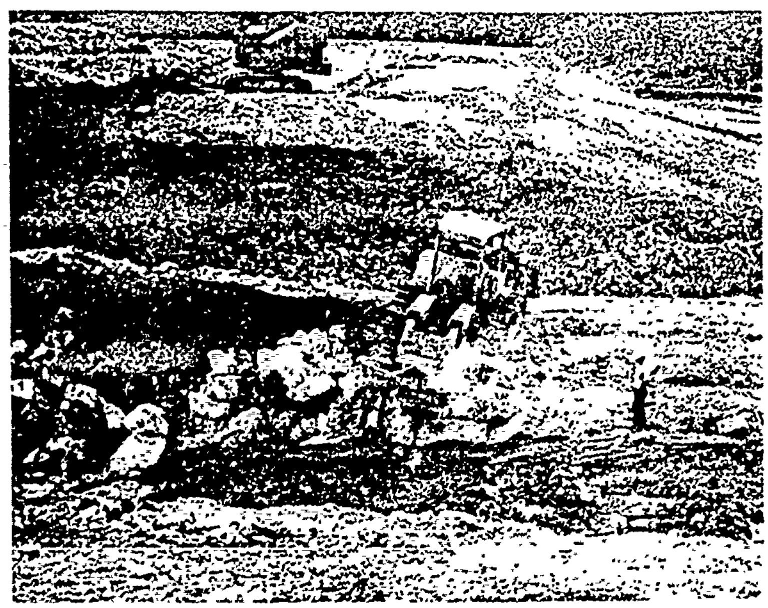


Photo. No. 22

4-19-72
D-9 Ripper removing rock overhang under upstream random fill zone near sta 17+50.

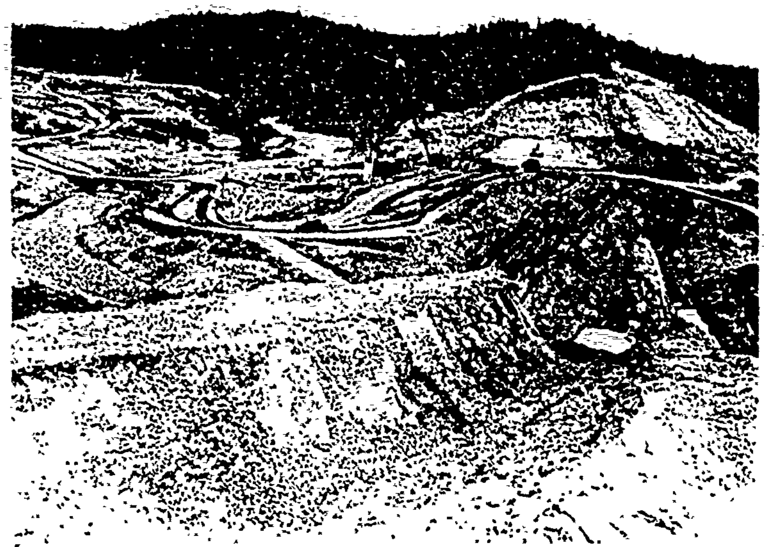


Photo No. 23

5-26-72
Overall view of main embankment C.O.T. Foreground shows C.O.T. from sta 9+50 to 11+00 right center of photo shows the natural C.O.T.

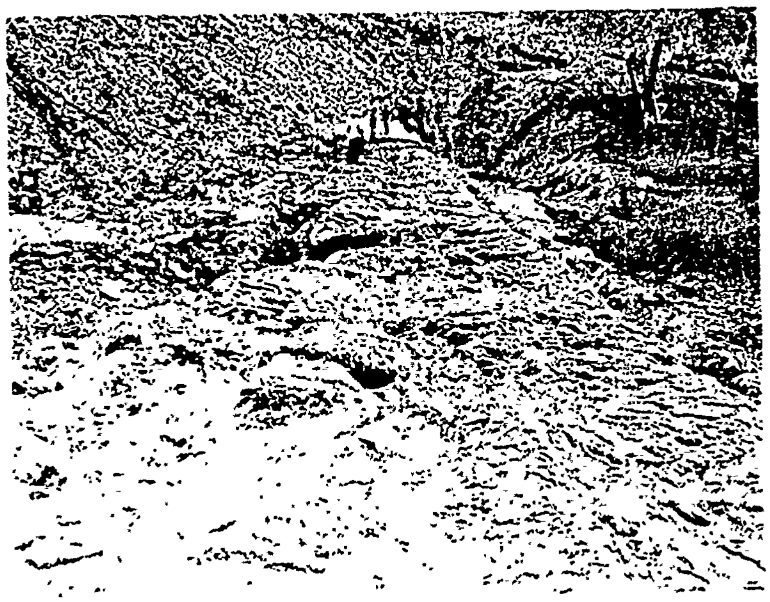


Photo. No. 24

8-4-72
Foundation along center line from sta 16+00 to 18+00. The upper line of grout holes in the overlap section occurs where the men are standing.

Photo. No. 25

7-27-72
Natural C.O.T. from sta 18+00 to 19+00. Note overhang to be removed in d/s face also the lower line of grout holes in the overlap section occurs in this area.

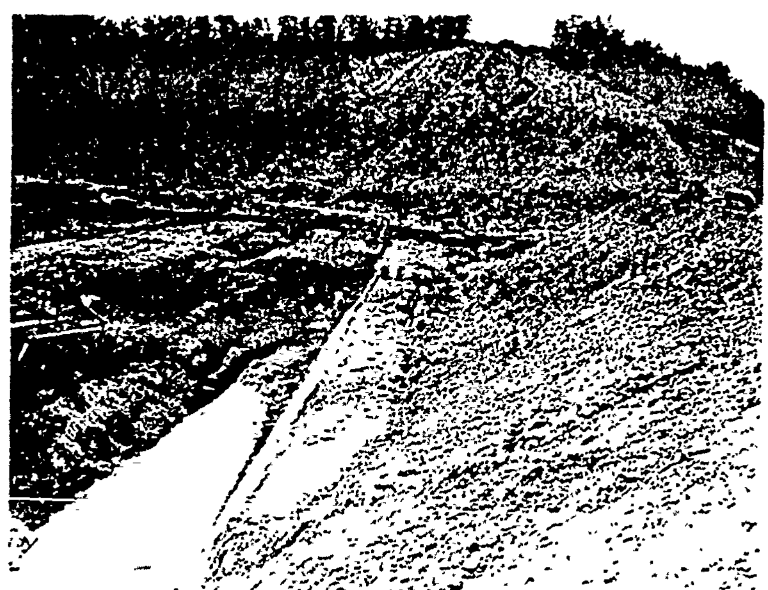
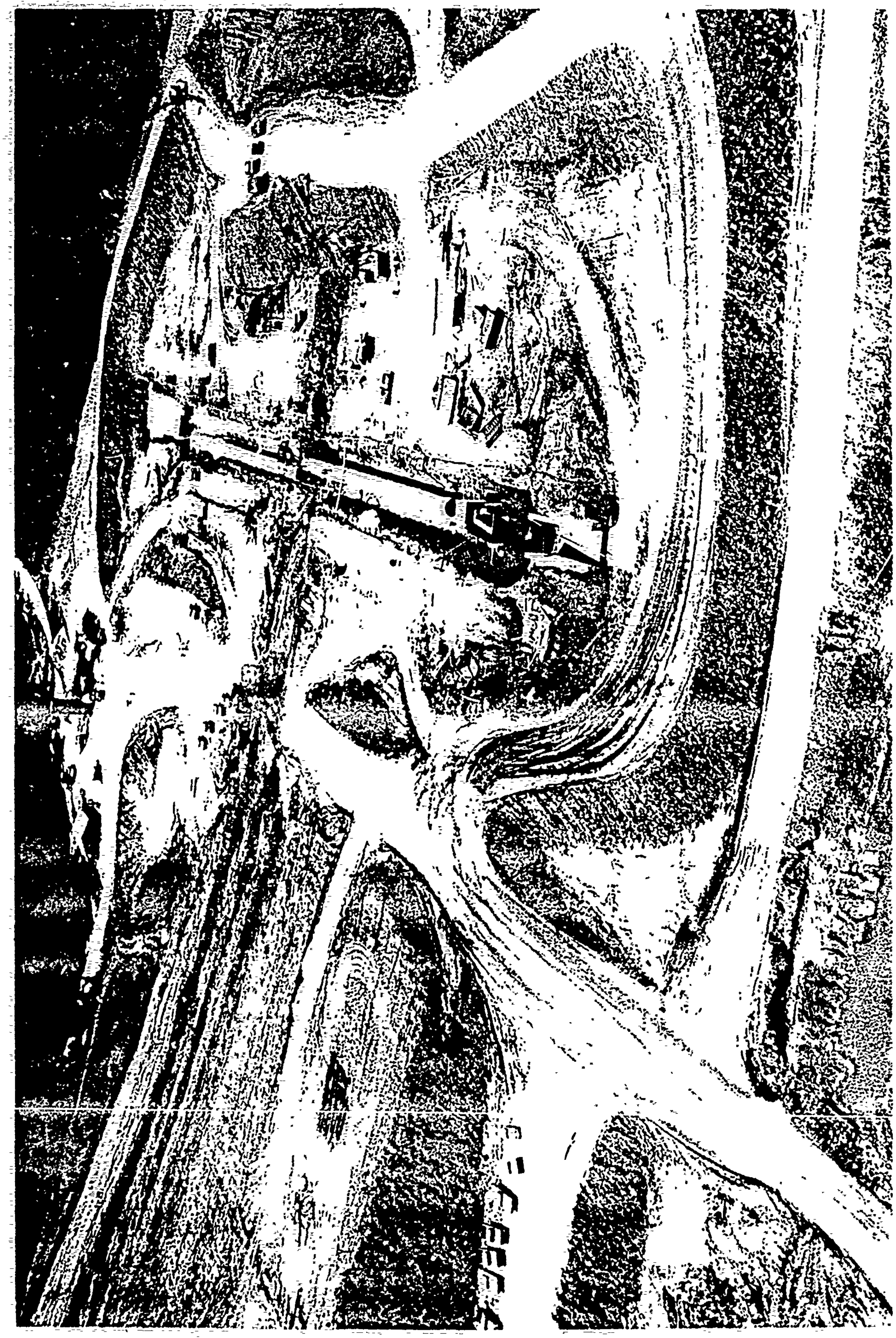


Photo. No. 26

8-4-72
Overall view of the center line from sta 15+00 to 18+50. Center line in the foreground falls in the water in the lower left corner. Centerline in the background fall under the dozer.

DIERKS DAM - December 1970 - Damsite, looking toward left abutment.

Photograph No. 27



DIERKS DAM - July 1971 - Construction of outlet works, looking downstream.

Photograph No. 28

DIERKS DAM - March 1972 - Construction of outlet works and embankment, looking downstream.

Photograph No. 29

DIERKS DAM - July 1972 - Main embankment construction, looking toward left abutment.

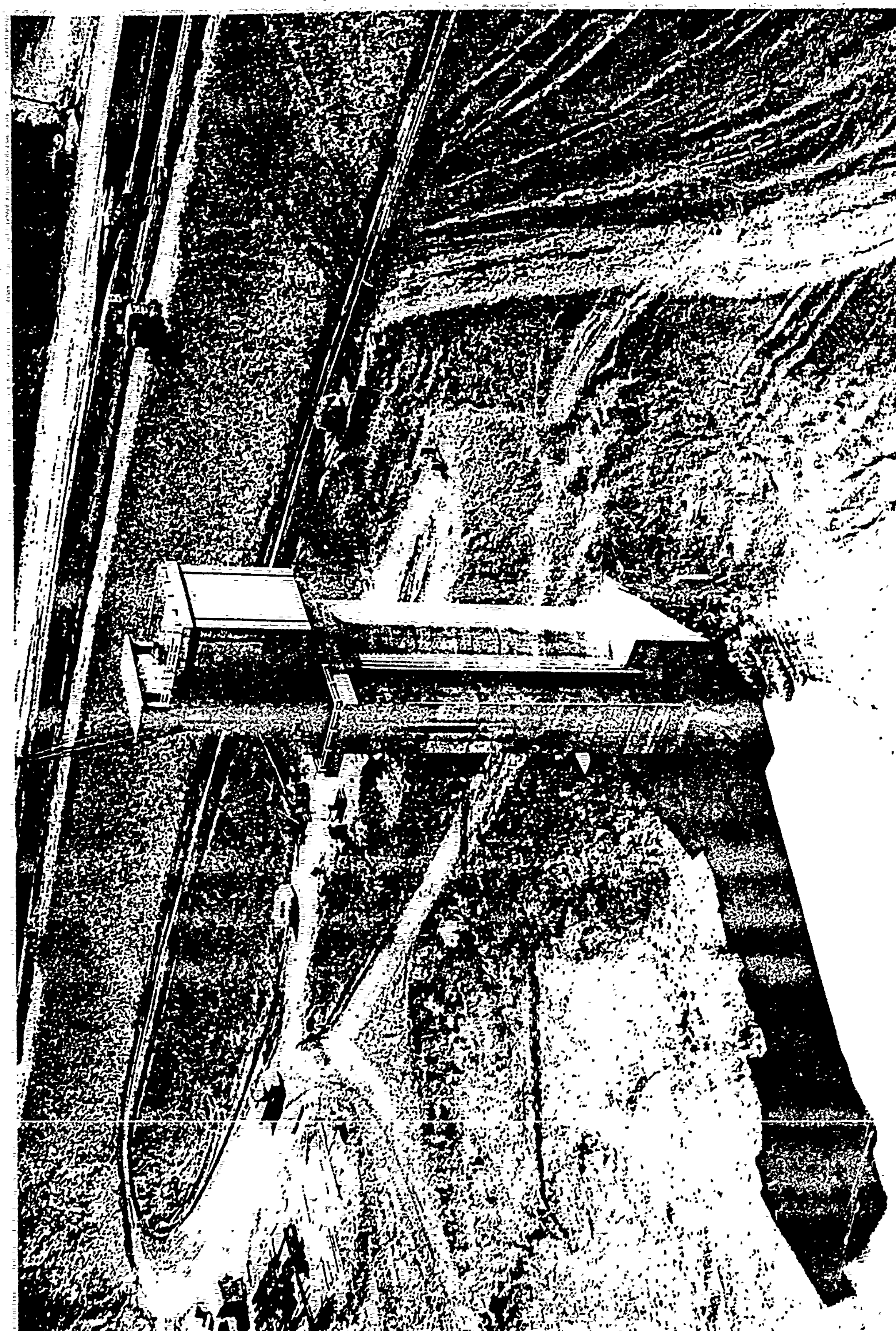
Photograph No. 30

DIERKS DAM - October 1972 - Conduit being used for diversion while work progresses on main embankment. Spillway excavation and right embankment in background.

Photograph No. 31

DIERKS DAM - April 1973 - Heavy rains caused flooding of construction site.
Lake elevation 512±.

Photograph No. 32



DIERKS DAM - October 1973 - Downstream view of gate tower construction.

Photograph No. 33

DIERKS DAM - April 1974 - Main embankment and outlet works essentially complete. Work progressing on service bridge.

APPENDIX B

SWDED - GL REPORT NO. 11227

DATED 27 SEPTEMBER 1971

REQUEST FOR AND RESULTS OF TESTS

PAGE NO. 1 | NO. OF PAGES 41

SECTION A - REQUEST FOR TEST TU-FM-72-5 dated 18 & 27 Aug 71

1. TO: (Include ZIP Code)	2. FROM: (Include ZIP Code)
Southwestern Division Laboratory U. S. Army Engineer Division, Southwestern Corps of Engineers 4815 Cass Street Dallas, Texas 75235	Chief, Foundations & Materials Branch U. S. Army Engineer District, Tulsa Corps of Engineers P. O. Box 61 Tulsa, Oklahoma 74102
3. PRIME CONTRACTOR AND ADDRESS (Include ZIP Code) CONTRACT NUMBER	4. MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code) P. O. NUMBER

5. END ITEM AND/OR PROJECT	6. SAMPLE NUMBER	7. LOT NO.	8. REASON FOR SUBMITTAL	9. DATE SUBMITTED
Dierks Dam				

10. MATERIAL TO BE TESTED	10a. QUANTITY SUBMITTED	11. QUANTITY REPRESENTED	12. SPEC. & AMEND AND/OR DRAWING NO & REV. FOR SAMPLE & DATE
Borrow	8 Bag Samples		

13. PURCHASED FROM OR SOURCE	14. SHIPMENT METHOD	15. DATE SAMPLED AND SUBMITTED BY
Test Fill and Quarry	Gov't Vehicle	

16. REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS.

Field No.	SWD Lab No.	Source	Material
1	X-15010	Quarry	Minus 3/4"
2	X-15011	Quarry	Minus No. 4
3	X-15012	Test Fill, Panel 1 South End	Minus 3/4"
4	X-15013	Test Fill, Panel 1 South End	Minus No. 4
5	X-15014	Test Fill, Panel 1 Center	Minus 3/4"
6	X-15015	Test Fill, Panel 1 Center	Minus No. 4
7	X-15016	Test Fill, Panel 1 North End	Minus 3/4"
8	X-15017	Test Fill, Panel 1 North End	Minus No. 4

17. SEND REPORT OF TEST TO

Tulsa Dist. O.

SECTION B - RESULTS OF TEST *(Continue on plain white paper if more space is required)*

1. DATE SAMPLE RECEIVED	2. DATE RESULTS REPORTED	3. LAB REPORT NUMBER
20 August 1971	29 September 1971	SWDED-GL Report No. 11227

4 TEST PERFORMED | RESULTS OF TEST | SAMPLE RESULT | REQUIREMENTS

See Test Data Summary (5 sheets) and Plates 1 - 35.

This completes requested testing.

DATE	TYPED NAME AND TITLE OF PERSON CONDUCTING TEST	SIGNATURE
29 Sep 71	HUGH E. GARRISON Director Southwestern Division Laboratory	Hugh E. Garrison

DD FORM 1 FEB 62 1222 REPLACES DD FORM 1222, 1 JUL 58, WHICH IS OBSOLETE.

TEST DATA SUMMARY

SWDED-GL Report 11227 FEATURE ______ Dierks Dam

Boring No.	Sam. No.	Depth or Elev of Sample	Laboratory Classification	Mechanical Analysis Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits LL	PL	Specific Gravity G	Nat Water Cont %	Natural Dry Density lbs/cu ft	Compaction Data Opt Water %	Maximum Dry Density lbs/cu ft
Quarry														
	1		SC	22	37	41		38	19				15.2	113.8
X-15010				-3/4" material				SAND, clayey gravelly						
	2		SC	0	53	47		35	18				16.0	113.2
X-15011				-#4 material				SAND, clayey						

Shear Data Initial e	Dry Density lbs/cu ft	w_o %	w_f %	S_o %	Type Test	Specimen Size Inches	Test	σ_3 T/sq ft	σ_1 T/sq ft	c T/sq ft	ϕ Degrees	Permeability e	k ft/min	Consolidation Data p_o T/sq ft	p_c T/sq ft	C_c	t_{50}	Remarks
637	102	130		54	TC-Q	1.4 x 2.9	1	05	314	07	20							
661	101	130		53		1.3 x 2.9	2	1.5	548									Remolded to 90% maximum density
648	101	130		54		1.3 x 2.9	3	3.0	883									at optimum -3% water content.
635	102	130		56		1.3 x 2.9	4	6.0	1465									
.635	102	156		66	TC-Q	1.3 x 3.0	1	0.5	276	08	12							
637	102	158		66		1.3 x 2.9	2	1.5	460									Remolded to 90% maximum density
645	102	150		62		1.4 x 3.0	3	3.0	670									at optimum water content.
.637	102	157		66		1.4 x 2.9	4	6.0	11.29									
636	102	190		80	TC-Q	1.3 x 2.9	1	0.5	1.80	05	3							
650	101	189		78		1.3 x 2.9	2	1.5	3.04									Remolded to 90% maximum density
635	102	190		80		1.3 x 2.9	3	3.0	4.84									at optimum +3% water content.
635	102	189		80		1.3 x 3.0	4	6.0	7.89									
575	106	129		60	TC-Q	1.3 x 2.9	1	05	364	09	21							
554	108	12.9		65		1.4 x 2.9	2	1.5	639									Remolded to 95% maximum density
558	107	120		62		1.4 x 2.9	3	3.0	9.68									at optimum -3% water content.
564	108	129		62		1.4 x 2.9	4	6.0	1558									
562	107	155		73	TC-Q	1.3 x 2.9	1	0.5	314	09	14							
548	108	156		76		1.4 x 3.0	2	1.5	552									Remolded to 95% maximum density
570	106	166		73		1.4 x 2.9	3	3.0	755									at optimum water content.
560	107	165		74		1.4 x 3.0	4	6.0	12.18									
558	107	189		91	TC-Q	1.4 x 2.9	1	05	2.06	07	2							
553	108	189		92		1.4 x 3.0	2	1.5	382									Remolded to 95% maximum density
576	106	182		89		1.4 x 2.9	3	3.0	485									at optimum +3% water content
.567	107	182		91		1.4 x 2.9	4	6.0	795									

TC – Triaxial Compression
UC – Unconfined Compression
DS – Direct Shear
Q – Unconsolidated Undrained
CD – Consolidated Drained
CU – Consolidated Undrained
* Values at Pressure T/SQ FT

ENG FORM 2086 1 MAR 56 (PREVIOUS EDITIONS MAY BE USED) (EM 1110-2-1803) (TRANSLUCENT)

Sheet 3 of 5

TEST DATA SUMMARY

SWDED-GL Report 11227

FEATURE Dierks Dam

Boring No.	Sam No.	Depth or Elev of Sample	Laboratory Classification	Mechanical Analysis: Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits: LL	PL	Specific Gravity G	Nat Water Cont %	Natural Dry Density lb/cu ft	Compaction Data: Opt Water %	Maximum Dry Density lb/cu ft	Shear Data: Initial e	Dry Density lb/cu ft				Type Test	Specimen Size Inches	Test	σ_3 T/sq ft	σ_1 T/sq ft	c T/sq ft	φ Degrees	Permeability: e	k ft/min	Consolidation Data: P_o T/sq ft	P_c T/sq ft	C_c	t_{50}	Remarks
Test Fill																																	
Panel 1, So. End																																	
	3		SC-SM	26	52	22		22	15				10.8	123.8																			
X-15012				-3/4" material				SAND, clayey gravelly																									
	4		SM-SC	0	72	28		21	16				12.0	121.2																			
X-15013				-#4 material				SAND, silty																									
Panel 1, Center																																	
	5		SC	26	46	28		27	16				11.4	122.4																			
X-15014				-3/4" material				SAND, clayey gravelly																									
	6		SC	0	63	37		27	15				12.3	120.3																			
X-15015				-#4 material				SAND, clayey																									
Panel 1, No. End																																	
	7		SC	22	49	29		25	15				10.5	123.9																			
X-15016				-3/4" material				SAND, clayey gravelly																									
	8		SC	0	54	36		25	15				12.3	119.8																			
X-15017				-#4 material				SAND, clayey																									

TC – Triaxial Compression DS – Direct Shear CD – Consolidated Drained *Values at Pressure T/SQ FT
UC – Unconfined Compression UU – Unconsolidated Undrained CU – Consolidated Undrained

ENG FORM 2086 1 MAR 60 (PREVIOUS EDITIONS MAY BE USED) (EM 1110-2-1803) (TRANSLUCENT)

TEST DATA SUMMARY

SWDED-GL Report 11227

FEATURE ______ Dierks Dam

Boring No.	Sam. No.	Depth or Elev of Sample	Laboratory Classification	Mechanical Analysis: Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits: LL	PL	Specific Gravity	Nat Water Cont %	Natural Dry Density Lbs/Cu Ft	Compaction Data: Opt Water %	Maximum Dry Density Lbs/Cu Ft	Initial e	Dry Density Lbs/Cu Ft	w_o %	w_f %	S %	Shear Data: Type Test	Specimen Size Inches	Test	σ_3	σ_1	c T/Sq Ft	φ Degrees	Permeability / Consolidation Data	Remarks
Quarry																												
		(Continued)																										
	2		SC	0	53	47		35	18				16.0	113.2														
X-5011				- #4 material				SAND, clayey								101	13.6	17.6		DS-S	3.0x3.0x0.5	1			0.0	30.	Remolded to 90% maximum density at optimum - 3% water content	
																101	13.5	17.9			3.0x3.0x0.5	2						
																101	16.1	18.6		DS-S	3.0x3.0x0.5	1			0.0	30.	Remolded to 90% maximum density at optimum water content	
																101	15.9	16.5			3.0x3.0x0.5	2						
																102	18.8	19.1		DS-S	3.0x3.0x0.5	1			0.0	28	Remolded to 90% maximum density at optimum + 3% water content	
																102	18.7	17.4			3.0x3.0x0.5	2						
																107	13.6	17.2		DS-S	3.0x3.0x0.5	1			0.0	29.	Remolded to 95% maximum density at optimum - 3% water content	
																107	13.7	17.7			3.0x3.0x0.5	2						
																107	15.8	18.3		DS-S	3.0x3.0x0.5	1			0.0	28.	Remolded to 95% maximum density at optimum water content	
																107	16.1	17.8			3.0x3.0x0.5	2						

TC – Triaxial Compression; UC – Unconfined Compression; DS – Direct Shear; UU – Unconsolidated Undrained; S CD – Consolidated Drained; CU – Consolidated Undrained; * Values at Pressure T/SQ FT

TEST DATA SUMMARY

Sheet 4 of 5

SWDED-GL Report 11227

FEATURE Dierks Dam

Boring No.	Sam. No.	Depth or Elev. of Sample	Laboratory Classification	Mechanical Analysis: Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits: LL	PL	Specific Gravity	Nat. Water Cont. %	Natural Dry Density Lbs/Cu Ft	Compaction Data: Opt. Water %	Maximum Dry Density Lbs/Cu Ft	Shear Data: Initial e	Dry Density Lbs/Cu Ft	w_o %	w_f %	S_o %	Type Test	Specimen Size Inches	Test	σ_3 T/Sq Ft	σ_1 T/Sq Ft	c T/Sq Ft	ϕ Degrees	Permeability: k	k	Consolidation Data: p_o* T/Sq Ft	p_c* T/Sq Ft	C_c	t_{50}*	Remarks
Test Fill - Composite of Samples 4, 6 and 8																																	
X-15017C			SC					24	15				12.2	120.4 (Average from tests of Samples 4, 6 and 8)																			
					-#4 material			SAND, clayey							.578	108	9.2		45	TC-Q	1.3 x 2.9	1	0.5	3.04	0.5	27							
															.540	108	9.2		45		1.3 x 3.0	2	1.5	6.19			Remolded to 90% maximum density						
															.556	107	9.2		44		1.3 x 2.9	3	3.0	10.03			at optimum -3% water content.						
															.553	107	9.1		44		1.3 x 2.9	4	6.0	17.84									
															.587	105	12.0		54	TC-Q	1.3 x 2.9	1	0.5	2.16	0.3	23							
															.550	107	11.3		57		1.3 x 2.9	2	1.5	4.55			Remolded to 95% maximum density						
															.527	109	11.7		59		1.3 x 2.9	3	3.0	8.02			at optimum water content.						
															.535	108	11.8		59		1.3 x 3.0	4	6.0	14.08									
															.539	108	15.1		75	TC-Q	1.6 x 3.0	1	0.5	1.55	0.4	6							
															.518	108	14.9		74		1.6 x 3.0	2	1.5	2.97			Remolded to 90% maximum density						
															.545	108	15.0		73		1.5 x 3.0	3	3.0	5.02			at optimum +3% water content.						
															.540	108	15.1		74		1.4 x 2.9	4	6.0	8.48									
															.462	114	9.4		54	TC-Q	1.4 x 2.9	1	0.5	4.16	1.0	38							
															.469	113	9.1		52		1.4 x 2.9	2	1.5	7.52			Remolded to 95% maximum density						
															.463	114	9.0		52		1.4 x 2.9	3	3.0	11.70			at optimum -3% water content.						
															.467	114	9.1		52		1.4 x 2.9	4	6.0	19.73									
															.447	115	11.9		71	TC-Q	1.3 x 3.0	1	0.5	3.06	0.6	25							
															.448	115	12.1		72		1.3 x 3.0	2	1.5	5.82			Remolded to 95% maximum density						
															.445	115	11.7		70		1.3 x 3.0	3	3.0	9.14			at optimum water content.						
															.457	114	11.8		69		1.3 x 3.0	4	6.0	16.69									
															.455	114	15.3		90	TC-Q	1.4 x 3.0	1	0.5	2.04	0.6	5							
															.452	115	15.2		90		1.4 x 3.0	2	1.5	3.42			Remolded to 95% maximum density						
															.448	115	15.1		90		1.4 x 2.9	3	3.0	5.44			at optimum +3% water content.						
															.460	114	15.3		89		1.4 x 2.9	4	6.0	8.66									

ENG FORM 2085 (PREVIOUS EDITIONS MAY BE USED) (TRANSLUCENT)
1 MAR 56

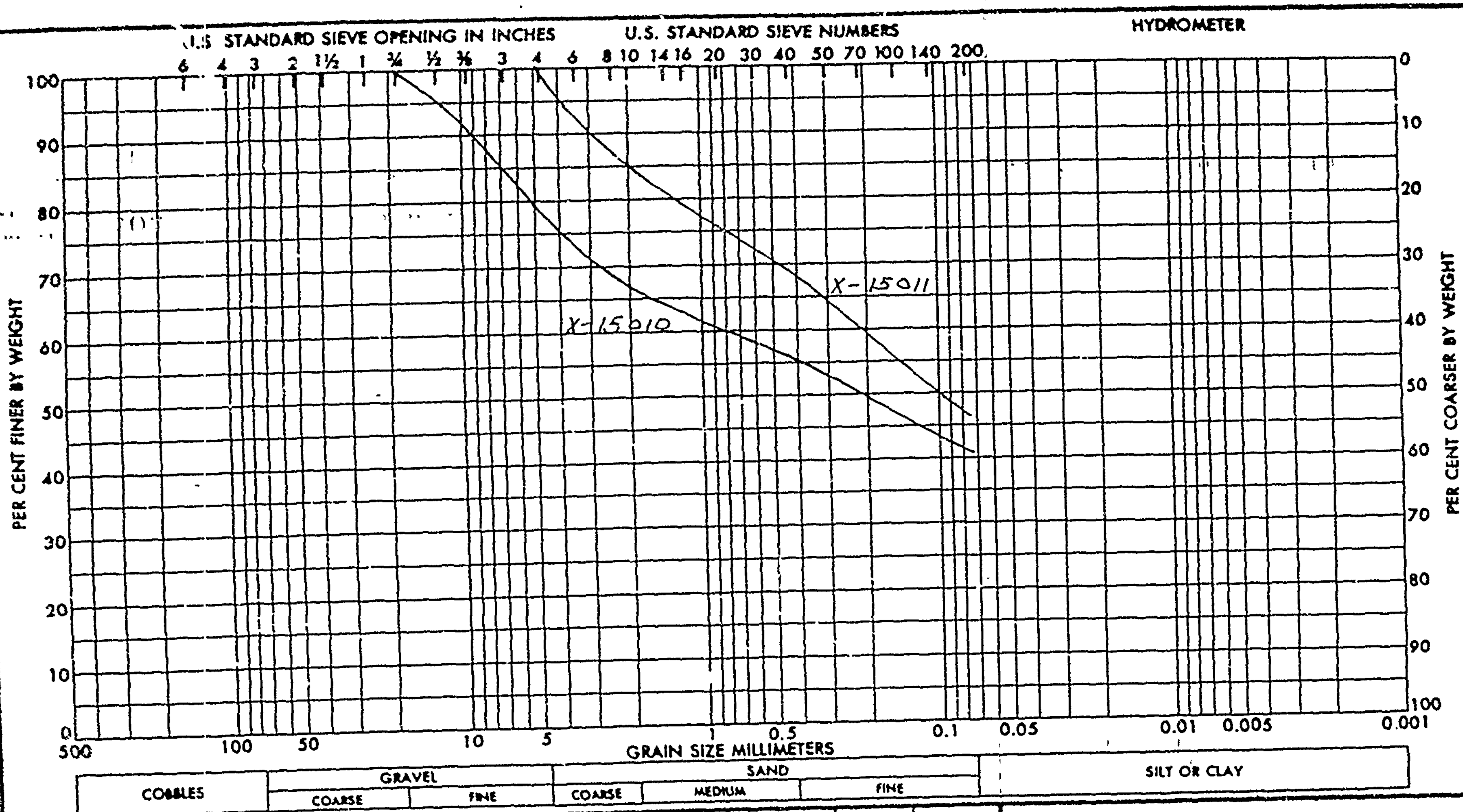
TC – Triaxial Compression UC – Unconfined Compression DS – Direct Shear QUU – Unconsolidated Undrained CD – Consolidated Drained CU – Consolidated Undrained *Values at Pressure T/SQ FT

TEST DATA SUMMARY

SWDED GL Report 11227 FEATURE ______ Dierks Dam

Boring No.	Sam. No.	Depth or Elev. of Sample	Laboratory Classification	Gravel %	Sand %	Fines %	D_{10}	LL	PL	Specific Gravity G	Nat. Water Cont. %	Natural Dry Density Lbs/Cu Ft	Opt. Water %	Maximum Dry Density Lbs/Cu Ft	Initial e	Dry Density Lbs/Cu Ft	w_o %	w_f %	S %	Type Test	Specimen Size Inches	Test	σ_3 T/SQ FT	σ_1 T/SQ FT	c T/SQ FT	ϕ Degrees	Permeability / Consolidation Data	Remarks
Test Fill																												
Composite of Sample 4, 6 and 8 (Continued)																												
X-15017-C			SC					24	15				12.2	120.4	(Average from tests of Samples 4, 6 and 8)													
				-#4 material				SAND clayey								108	9.3	14.2		DS-S	3.0 x 3.0 x 0.5	1			0.0	34	Remolded to 90% maximum density	
																108	9.2	13.0			3.0 x 3.0 x 0.5	2					at optimum - 3% water content	
																107	12.6	13.7		DS-S	3.0 x 3.0 x 0.5	1			0.0	34	Remolded to 90% maximum density	
																108	12.1	13.9			3.0 x 3.0 x 0.5	2					at optimum water content	
																108	15.3	14.9		DS-S	3.0 x 3.0 x 0.5	1			0.0	35	Remolded to 90% maximum density	
																108	15.2	13.0			3.0 x 3.0 x 0.5	2					at optimum + 3% water content	
																114	9.3	14.1		DS-S	3.0 x 3.0 x 0.5	1			0.0	33	Remolded to 95% maximum density	
																114	9.4	14.1			3.0 x 3.0 x 0.5	2					at optimum - 3% water content	
																114	12.2	13.8		DS-S	3.0 x 3.0 x 0.5	1			0.0	33	Remolded to 95% maximum density	
																114	12.1	13.4			3.0 x 3.0 x 0.5	2					at optimum water content	
																114	15.3	13.8		DS-S	3.0 x 3.0 x 0.5	1			0.0	34	Remolded to 95% maximum density	
																114	15.3	14.2			3.0 x 3.0 x 0.5	2					at optimum + 3% water content	

TC – Triaxial Compression; UC – Unconfined Compression; DS – Direct Shear; UU – Unconsolidated Undrained; S – Consolidated Drained; CU – Consolidated Undrained; *Values at Pressure T/SQ FT



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
X-15010		Clayey gravelly SAND (SC)		38	19	19
-15011		Clayey SAND (SC)		35	18	17

PROJECT Dierks Dam

AREA

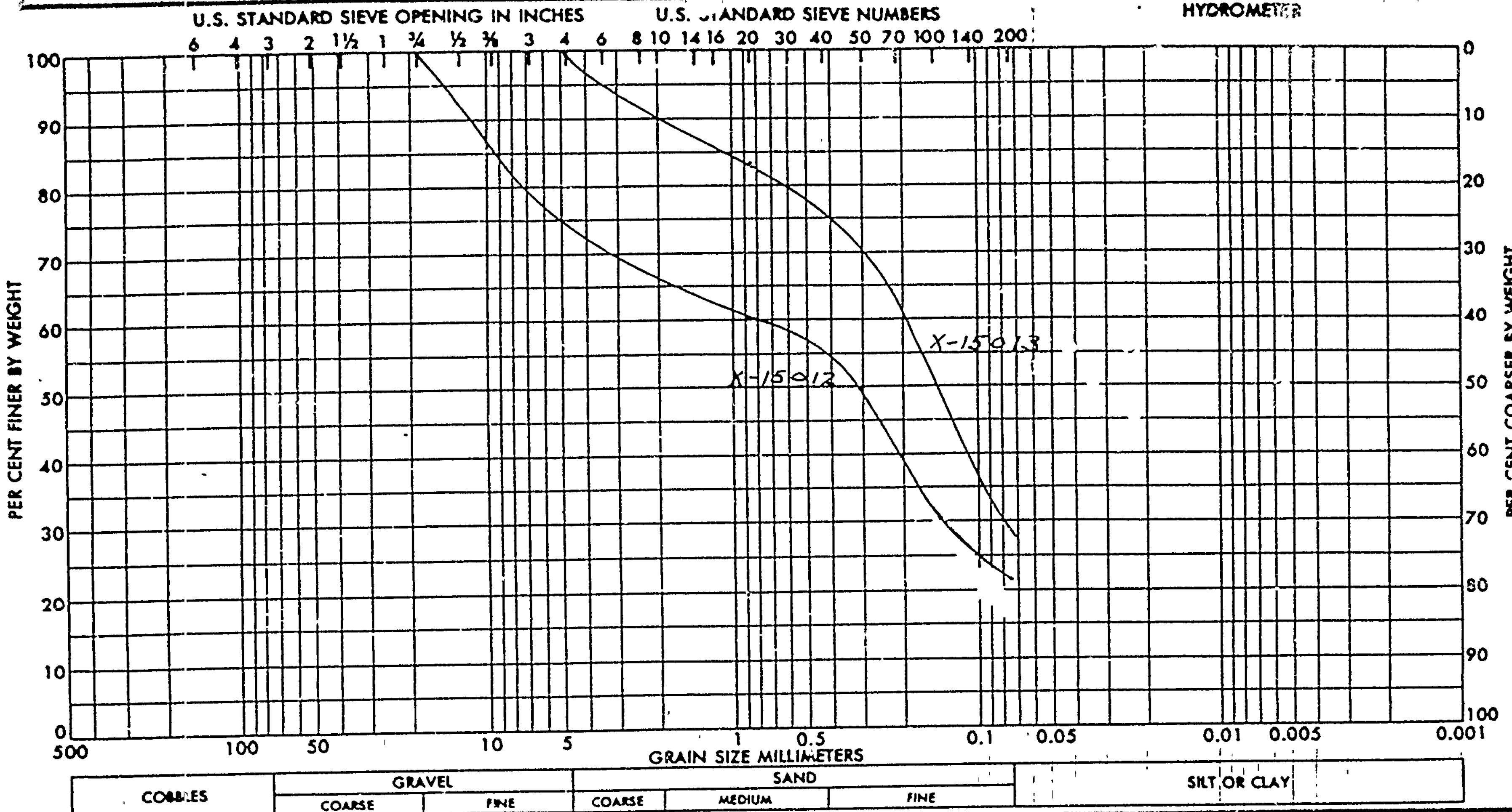
BORING NO. Quarry

DATE SEP 7[illegible]

GRADATION CURVES

ENG FORM 2087 REPLACES WES FORM NO. 1241, SEP 1962, WHICH IS OBSOLETE.

U.S. GOVERNMENT PRINTING OFFICE : 1963 OF—709-126



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
X-15012		Clayey gravelly SAND (SC-SM)		22	15	7
-15013		Silty SAND (SM-SC)		21	16	5

PROJECT DIERK'S DAM

AREA Test fill

BORING NO. Panel 1, So. end

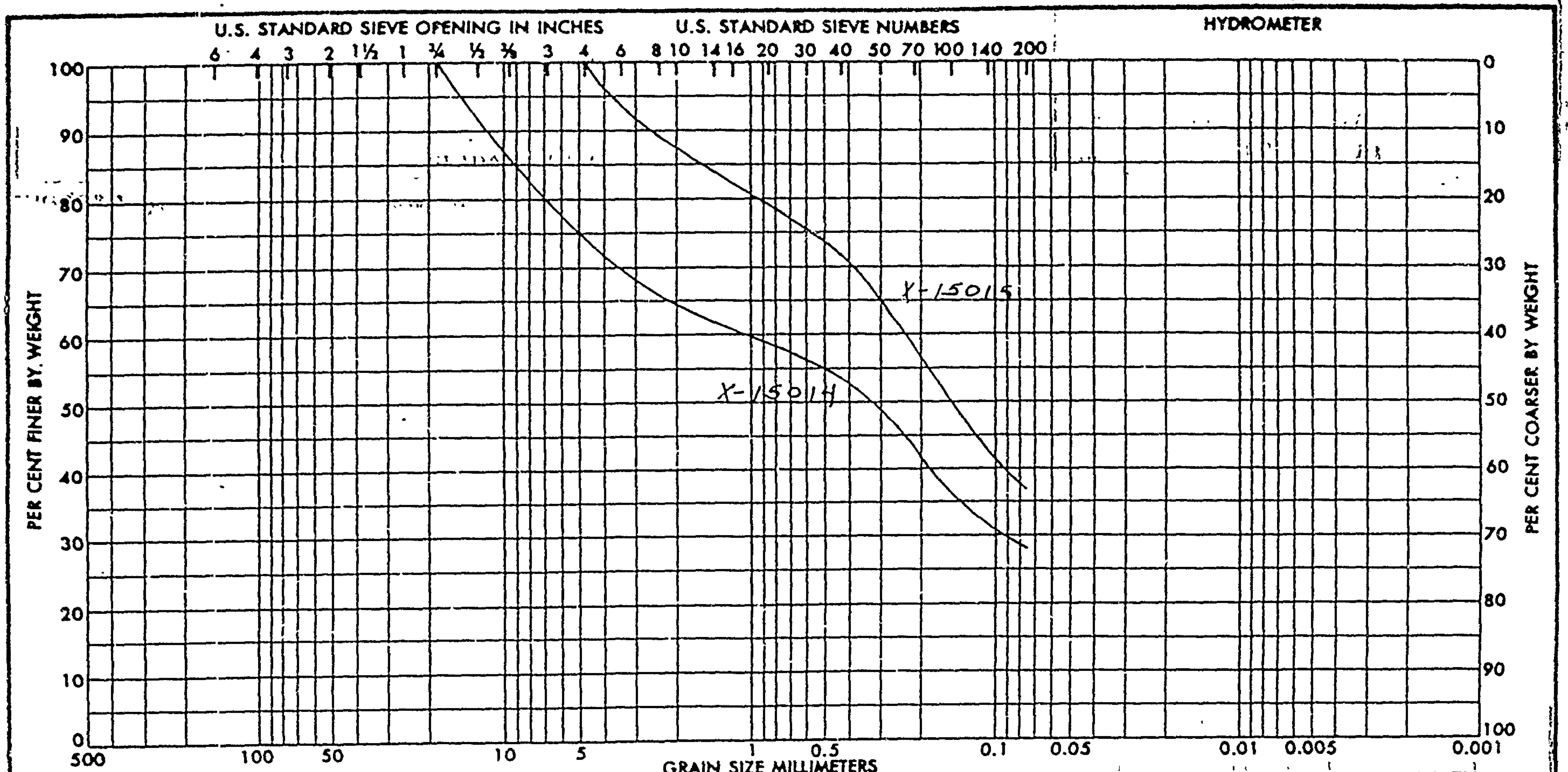
DATE SEP 71

GRADATION CURVES

ENG FORM 2087
1 MAY 63

REPLACES WES FORM NO. 1241, SEP 1962, WHICH IS OBSOLETE.

U.S. GOVERNMENT PRINTING OFFICE : 1963 OF—799-128



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
X-15014		Clayey gravelly SAND (SC)		27	16	11
-15015		Clayey SAND (SC)		27	15	12

PROJECT DIERKS DAM

AREA Test fill

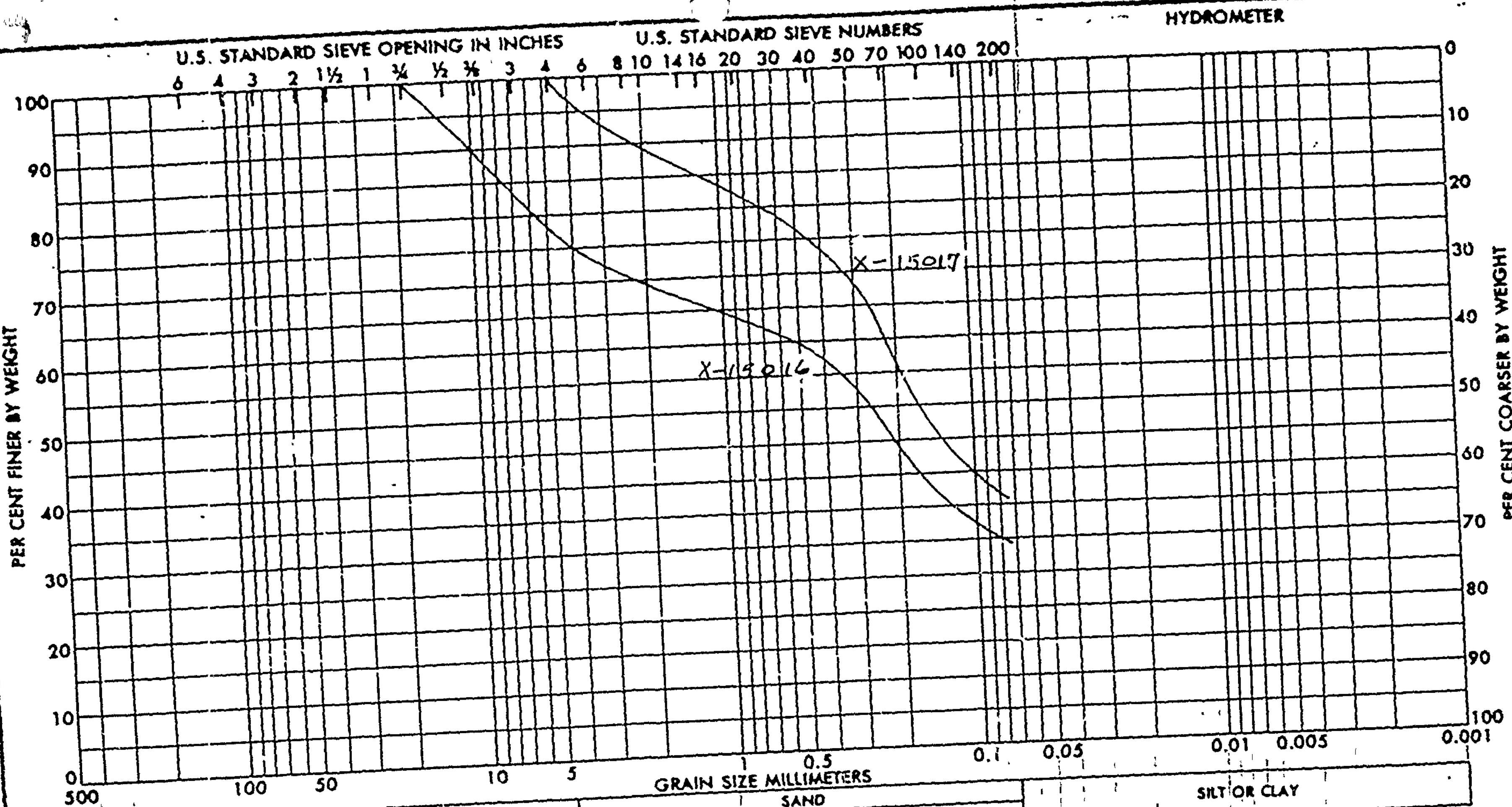
BORING NO. Panel 1, center

DATE SEP 71

GRADATION CURVES

ENG FORM 2087

REPLACES WES FORM NO. 1241, SEP 1962, WHICH IS OBSOLETE.



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
X-15016		Clayey gravelly SAND (SC)		25	15	10
X-15017		Clayey SAND (SC)		25	15	10

PROJECT DIERKS DAM

AREA Test fill

BORING NO. Panel 1, No. end

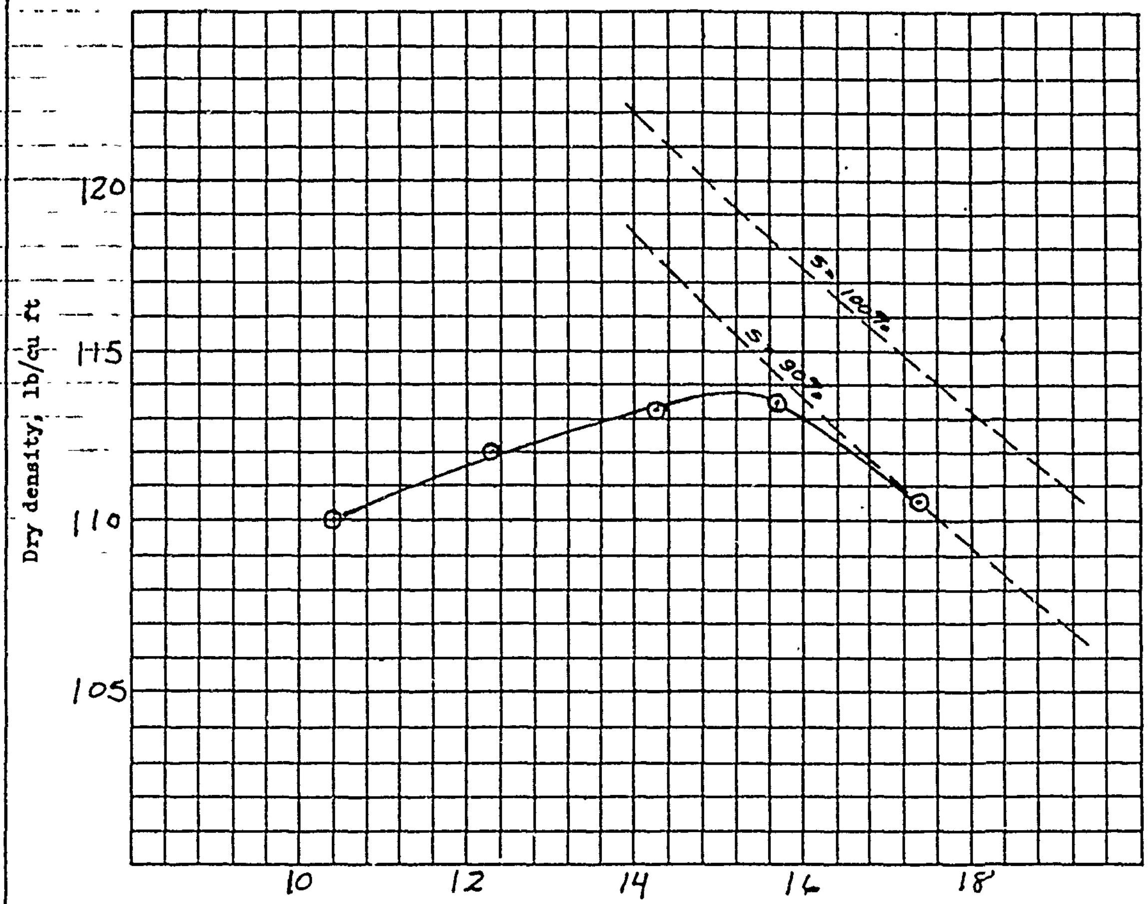
DATE SEP 71

GRADATION CURVES

ENG FORM 2087
1 MAY 63

REPLACES WES FORM NO. 1241, SEP 1962, WHICH IS OBSOLETE.

U S GOVERNMENT PRINTING OFFICE 1963 OF—700-126



Standard compaction test

56 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 6 inch diameter mold

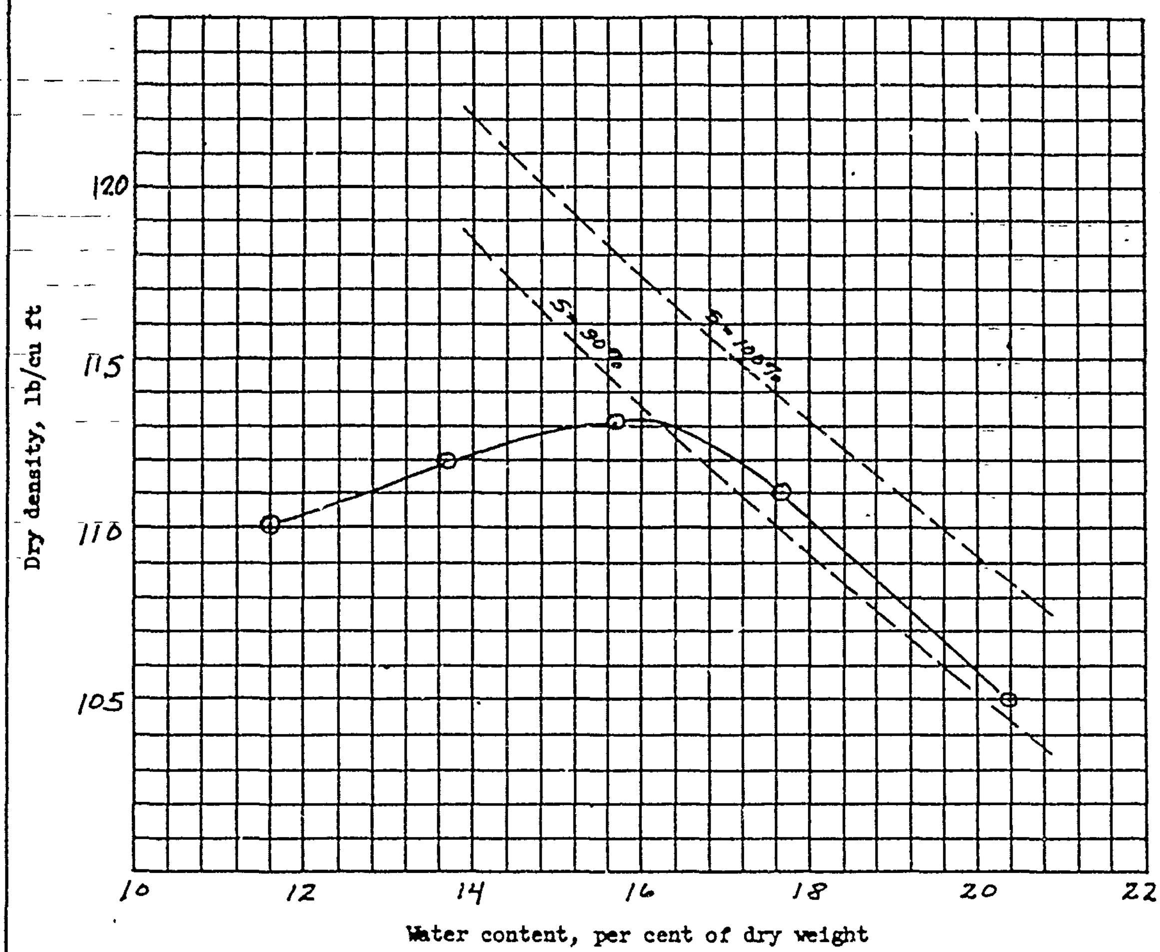
Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
	--	Clayey gravelly SAND (SC)	2.69 est.	38	19	22	0

Sample No.	X-15010			
Natural water content in per cent				
Optimum water content in per cent	15.2			
Max dry density in lb/cu ft	113.8			

Remarks	Project DIERKS DAM	
	Area Quarry	
	Boring No.	Date SEP 71

COMPACTION TEST REPORT

ENG FORM 1 MAY 63 2091 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)



Standard compaction test

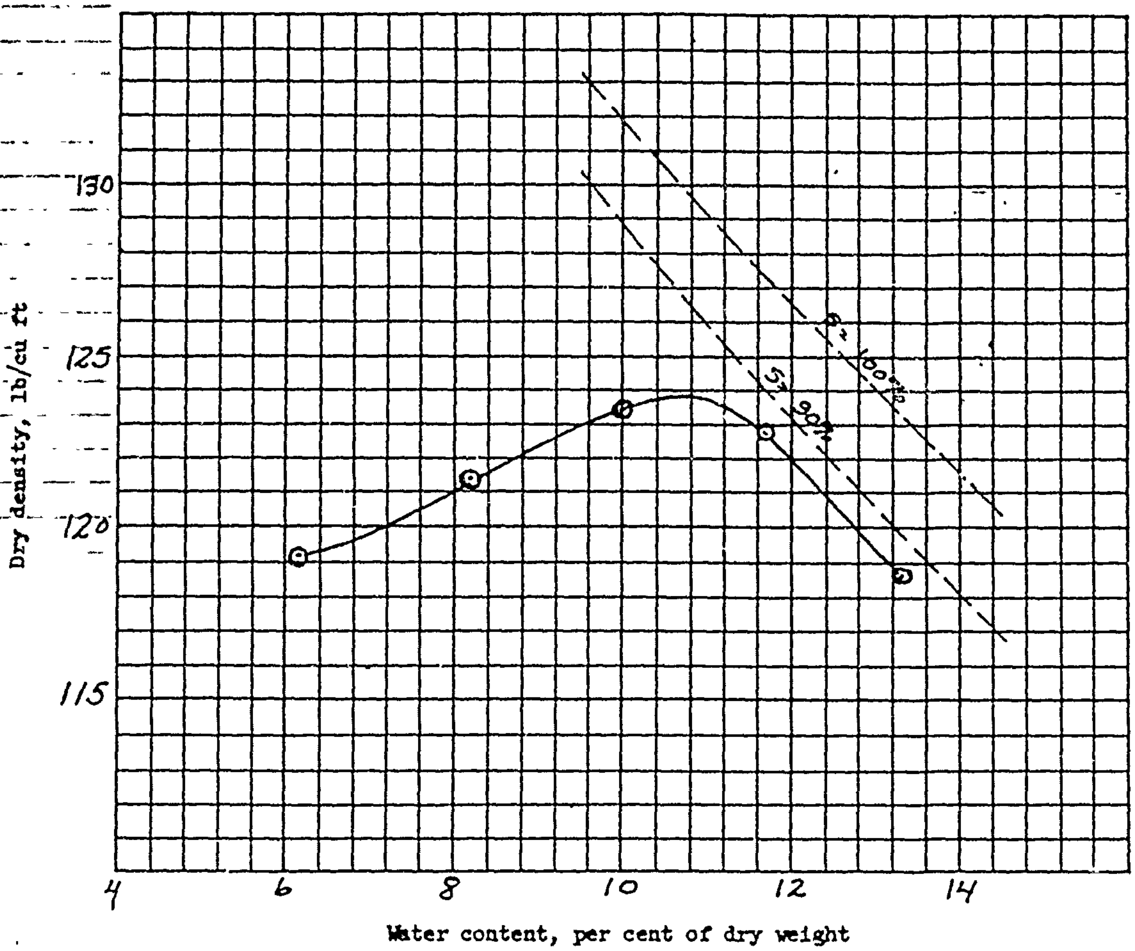
25 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 4 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey SAND (SC)	2.69 est.	35	18		

Sample No.	X-15011			
Natural water content in per cent				
Optimum water content in per cent	16.0			
Max dry density in lb/cu ft	113.2			

Remarks	Project DIERKS DAM	
	Area Quarry	
	Boring No.	Date SEP 71
	COMPACTION TEST REPORT	



Standard compaction test

56 blows per each of 3 layers, with 5.5 lb rammer and

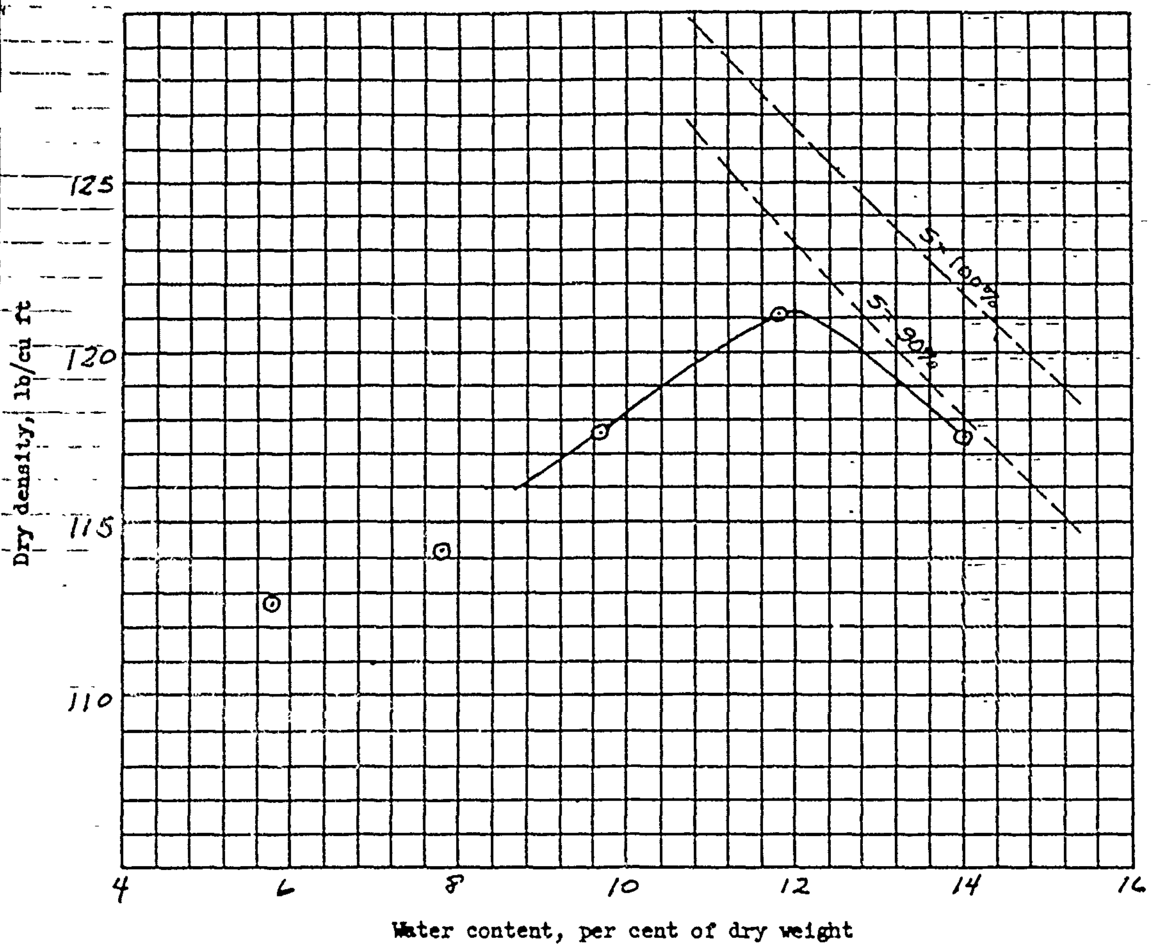
12 inch drop. 6 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
	---	Clayey gravelly SAND (SC-SM)	2.68 est	22	15	26	0

Sample No.	X-15012			
Natural water content in per cent				
Optimum water content in per cent	10.8			
Max dry density in lb/cu ft	123.8			

Remarks	Project DIERKS DAM	
	Area Test Fill	
	Boring No. Panel 1, So. end	Date SEP 71
	COMPACTION TEST REPORT	

ENG FORM 2091 1 MAY 63 — PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)



Standard compaction test

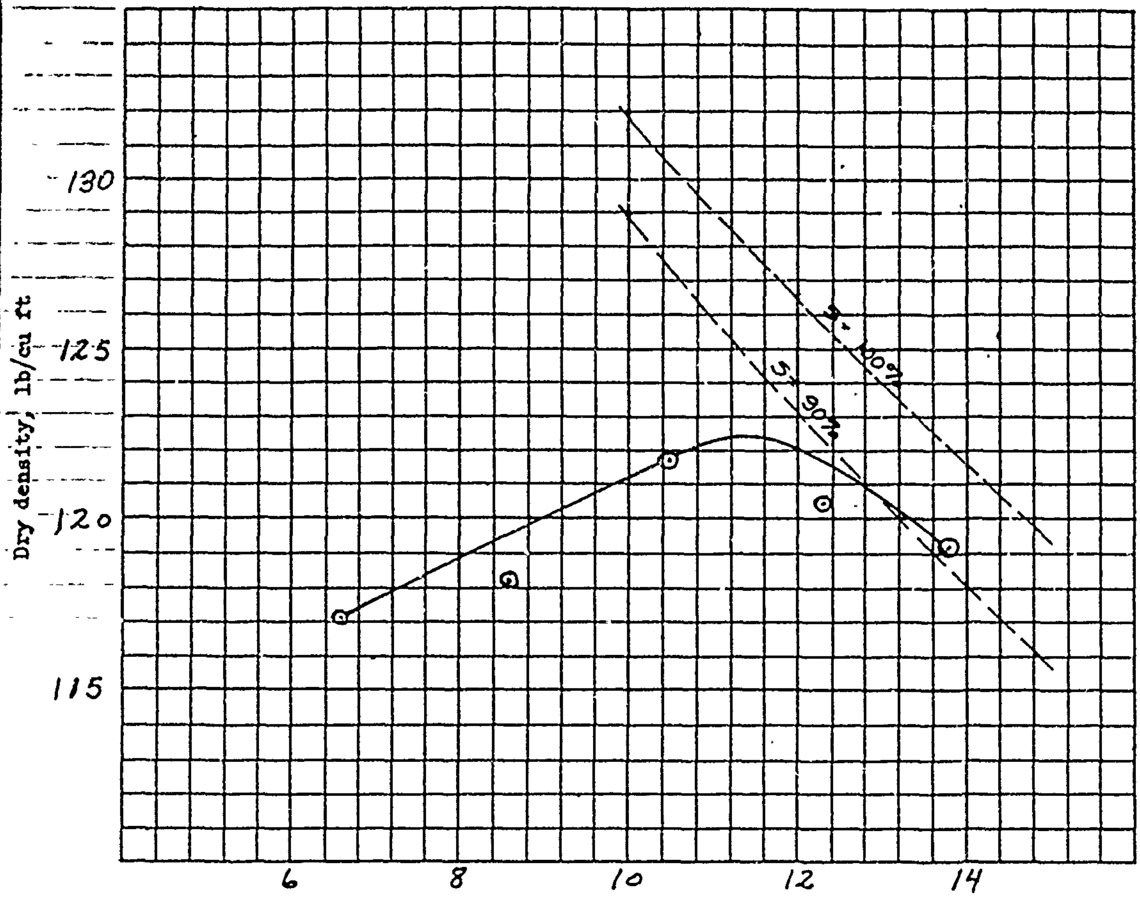
25 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 4 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Silty SAND (SM-SC)	2.68 est.	21	16		

Sample No.	X-15013			
Natural water content in per cent				
Optimum water content in per cent	12.0			
Max dry density in lb/cu ft	121.2			

Remarks	Project DIERKS DAM
	Area Test fill
	Boring No. Panel 1, So. end — Date SEP 71
	COMPACTION TEST REPORT



Standard compaction test

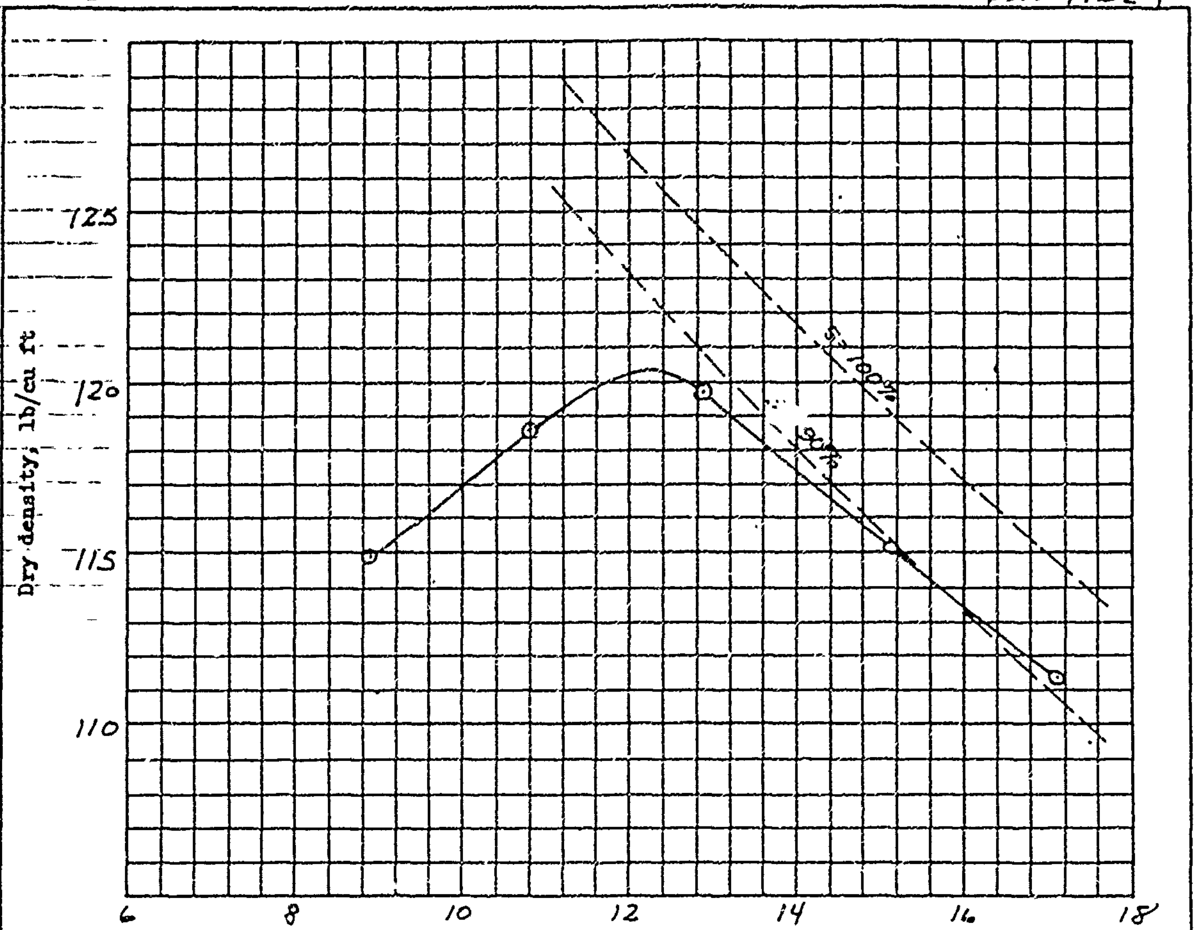
56 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 6 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey gravelly SAND (SC)	2.68 est.	27	16	26	0

Sample No.	X-15014			
Natural water content in per cent				
Optimum water content in per cent	11.4			
Max dry density in lb/cu ft	122.4			

Remarks	Project DIERKS DAM	
	Area Test fill	
	Boring No. Panel 1 center	Date SEP 71
	COMPACTION TEST REPORT	



Standard compaction test

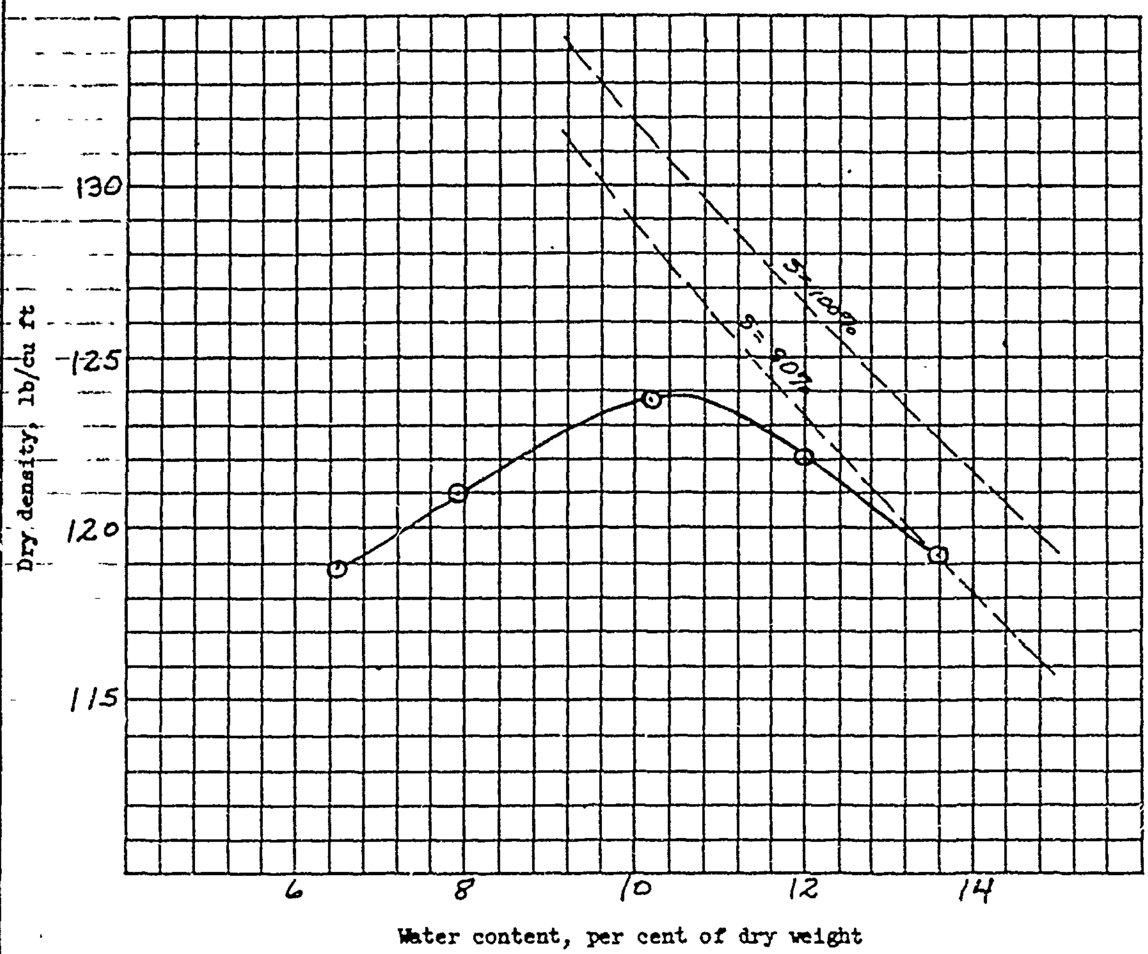
25 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 4 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey SAND (SC)	2.68 est.	27	15		

Sample No.	X-15015			
Natural water content in per cent				
Optimum water content in per cent	12.3			
Max dry density in lb/cu ft	120.3			

Remarks	Project DIERKS DAM	
	Area Test fill	
	Boring No. Panel 1, center	Date SEP 71
	COMPACTION TEST REPORT	



Standard compaction test

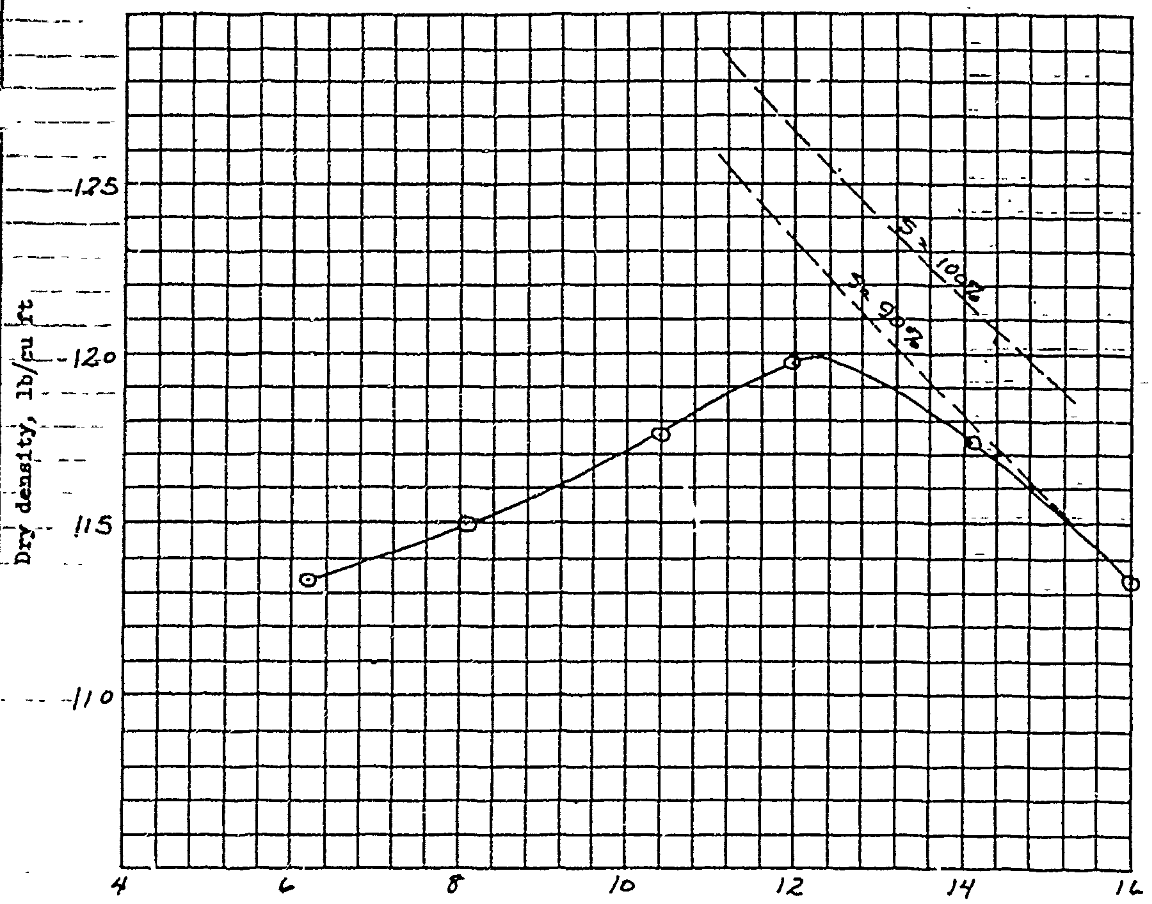
56 blows per each of 3 layers, with 5.5 lb rammer and 12 inch drop. 6 inch diameter mold

Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey gravelly SAND (SC)	2.68 est.	25	15	22	0

Sample No.	X-15016			
Natural water content in per cent				
Optimum water content in per cent	10.5			
Max dry density in lb/cu ft	123.9			

Remarks	Project DIERKS DAM	
	Area Test fill	
	Boring No. Panel 1, N. end	Date SEP 71
	COMPACTION TEST REPORT	

ENG FORM 2091 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)



Water content, per cent of dry weight

Standard compaction test

25 blows per each of 3 layers, with 5.5 lb rammer and

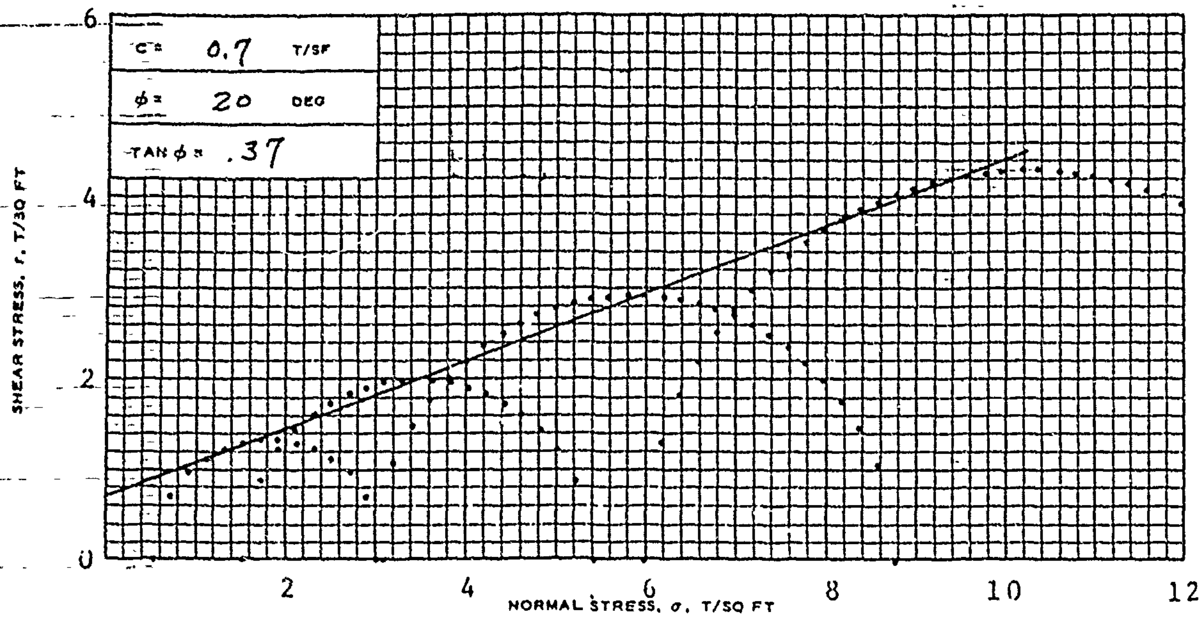
12 inch drop. 4 inch diameter mold

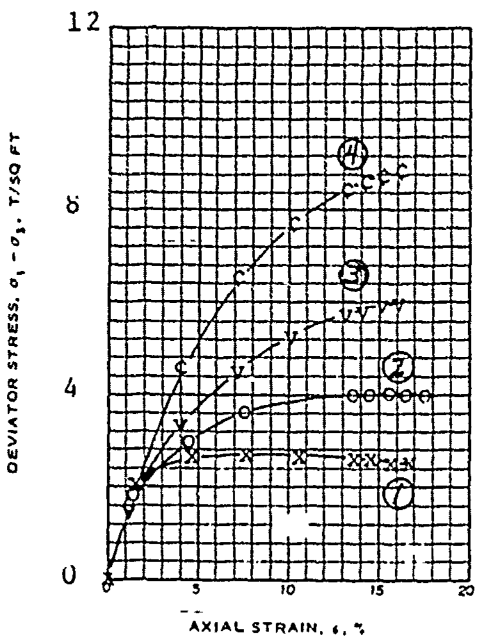
Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
		Clayey SAND (SC)	2.68 est.	25	15		

Sample No.	X-15017			
Natural water content in per cent				
Optimum water content in per cent	12.3			
Max dry density in lb/cu ft	119.8			

Remarks	Project DIERKS DAM	
	Area Test fill	
	Boring No. Panel 1, No. end	Date SEP 71
	COMPACTION TEST REPORT	

ENG FORM 1 MAY 63 2091 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_0	13.0	13.0	13.0	13.0
	DRY DENSITY LB/CU FT	γd_0	102	101	101	102
	SATURATION, %	S_0	54	53	54	55
	VOID RATIO	e_0	.637	.661	.648	.635
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_0				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.64	3.98	5.83	8.65
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	12	23	24	23
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_0	1.4	1.3	1.3	1.3
INITIAL HEIGHT, IN.		H_0	2.9	2.9	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, w-3)

LL 35	PL 18	PI 17	G 2.69 est.	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

90%

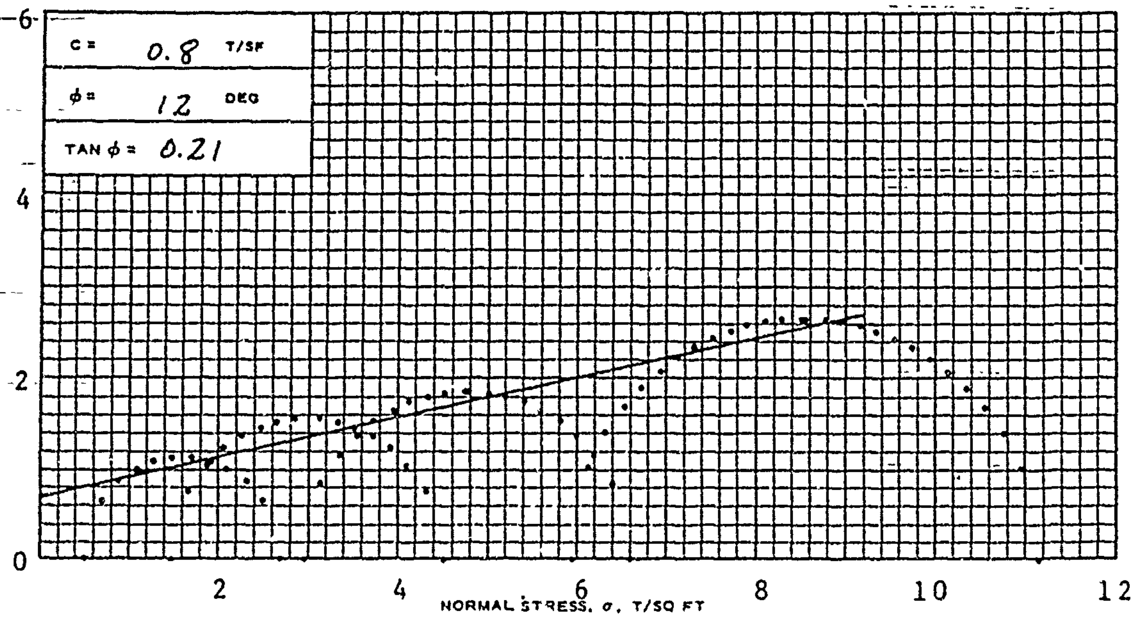
BORING NO Quarry — SAMPLE NO. X-15011

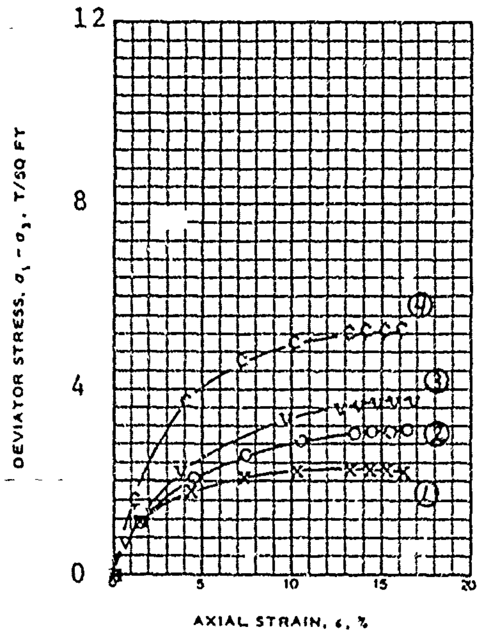
DEPTH/ELEV

LABORATORY SWD — DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_0	15.6	15.8	15.0	15.7
	DRY DENSITY LB/CU FT	γd_0	102	102	102	102
	SATURATION, %	S_0	66	66	6[illegible]	66
	VOID RATIO	e_0	.635	.637	.645	.637
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_0				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.26	3.10	3.70	5.29
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	22	22	23	24
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_0	1.3	1.3	1.4	1.4
INITIAL HEIGHT, IN.		H_0	3.0	2.9	3.0	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, w)

LL 35	PL 18	PI 17	Gs 2.69 est.	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

90%

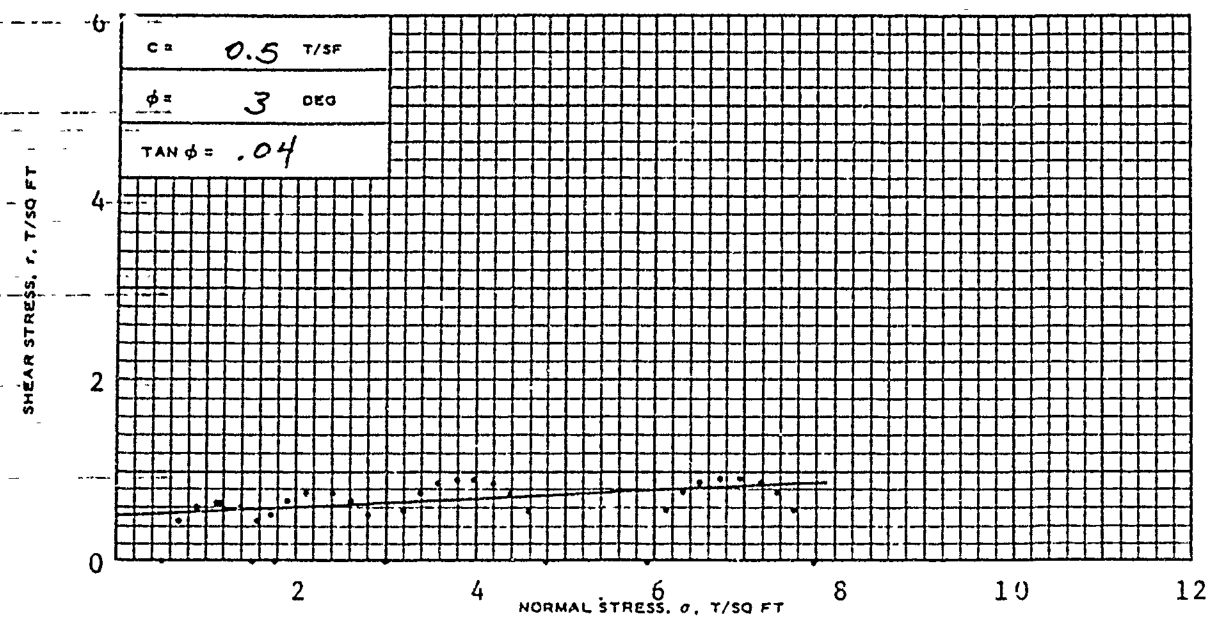
BORING NO. Quarry | SAMPLE NO. X-15011

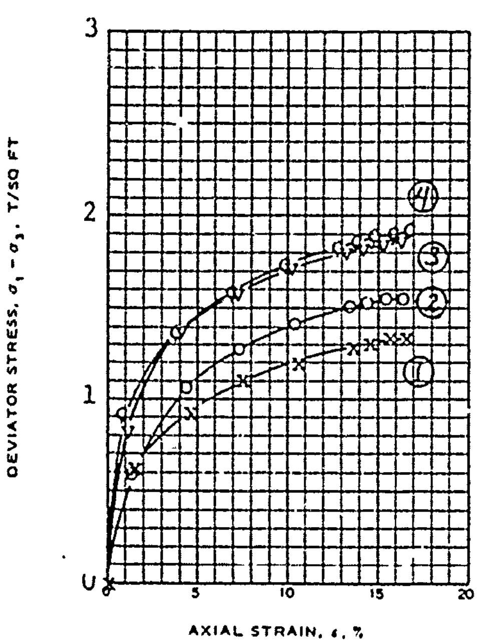
DEPTH/ELEV

LABORATORY SWD | DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





			1	2	3	4
SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	19.0	18.9	19.0	18.9
	DRY DENSITY LB/CU FT	γd_o	102	101	102	102
	SATURATION, %	S_o	80	78	80	80
	VOID RATIO	e_o	.636	.650	.635	.635
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.30	1.54	1.84	1.89
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	23	22	22	23
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.3	1.3	1.3
INITIAL HEIGHT, IN.		H_o	2.9	2.9	2.9	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, w+3)

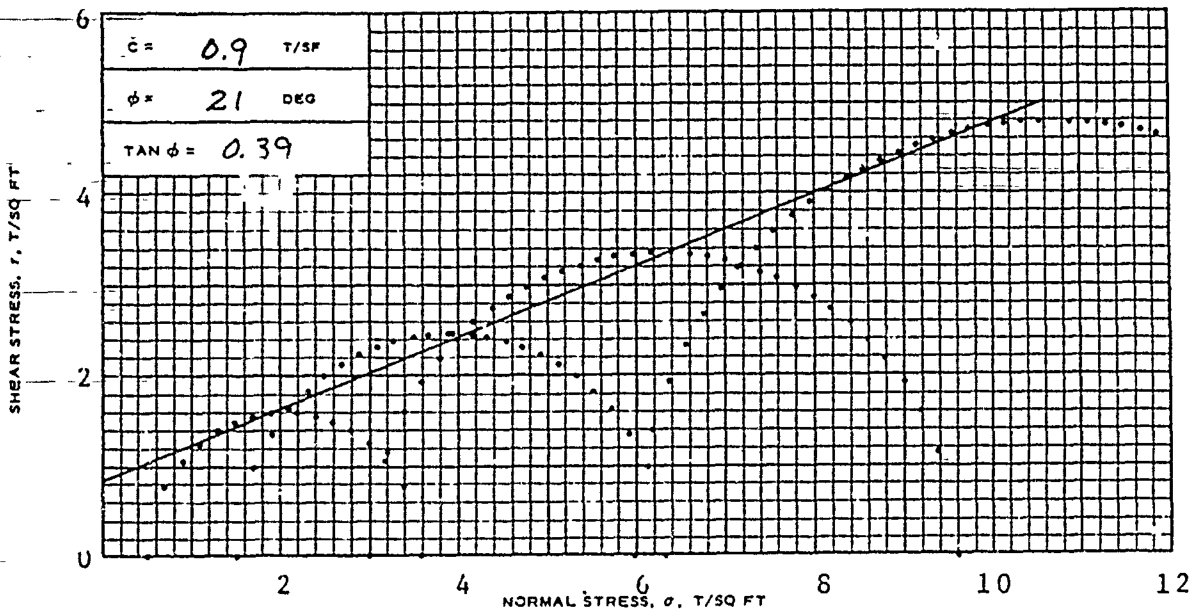
LL 35	PL 18	PI 17	G: 2.69 est.	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

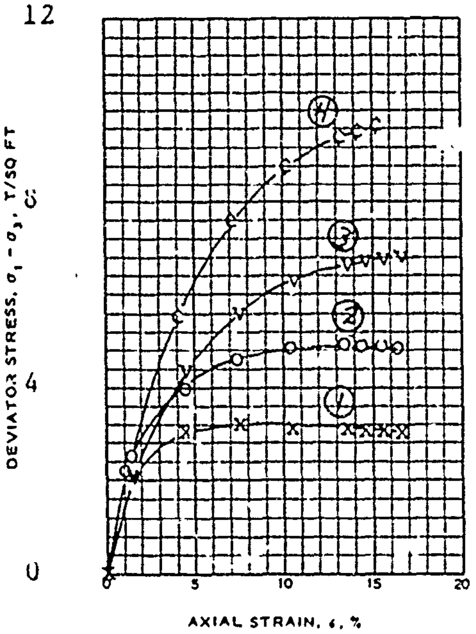
REMARKS:

PROJECT	Dierks Dam 90%
BORING NO. Quarry	SAMPLE NO. X-15011
DEPTH/ELEV	
LABORATORY SWD	DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT
REV JUNE 1970





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT %	w_o	12.9	12.9	13.0	12.9
	DRY DENSITY LB/CU FT	γd_o	106	108	107	108
	SATURATION, %	S_o	60	63	62	62
	VOID RATIO	e_o	.575	.554	.558	.554
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{max}$	3.14	4.89	6.68	9.58
TIME TO $(\sigma_1-\sigma_3)_{max}$, MIN		t_1	13	22	24	24
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1-\sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	2.9	2.9	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (95% γ, W-3)

LL 35	PL 18	PI 17	G 2.69 est.

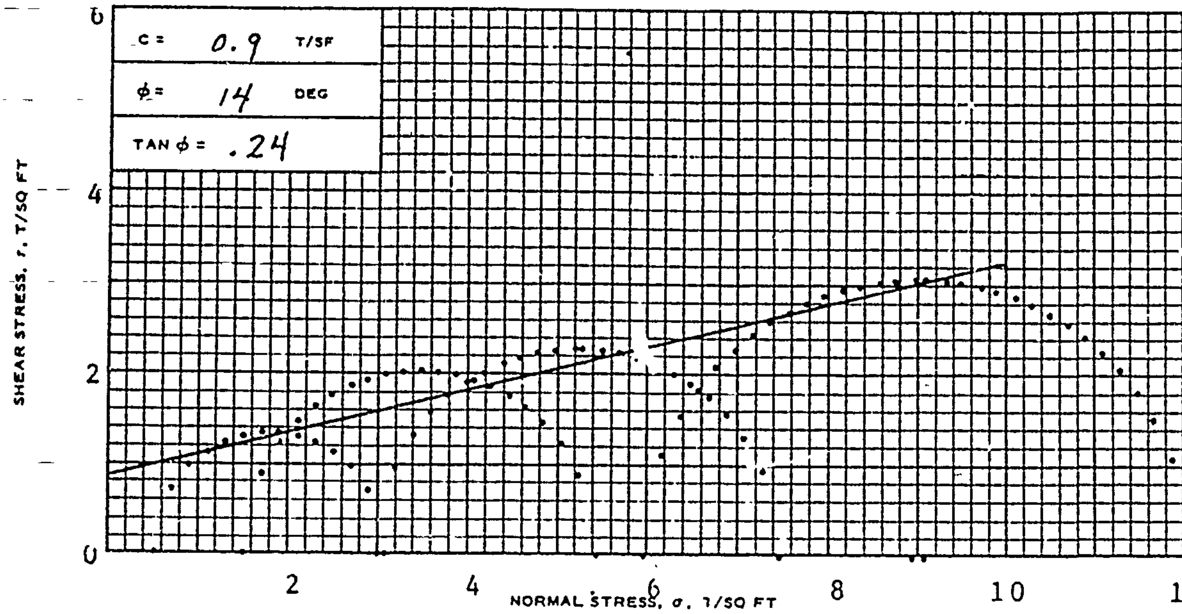
REMARKS:

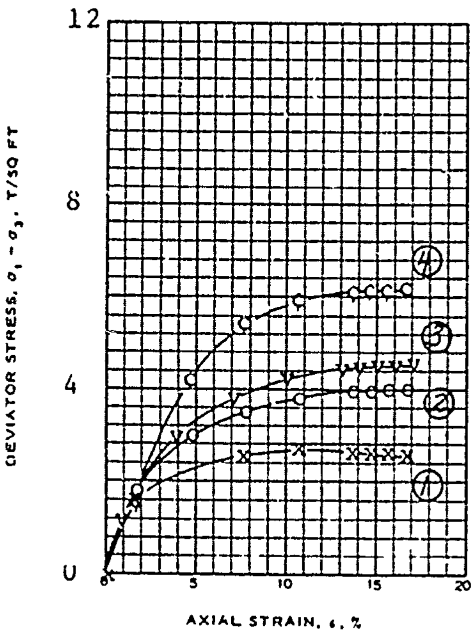
TYPE OF SPECIMEN Remolded	TYPE OF TEST Q
PROJECT Dierks Dam	
BORING NO. Quarry	SAMPLE NO. X-15011
DEPTH/ELEV	
LABORATORY SWD	DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate No. 16





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	15.5	15.5	15.6	15.5
	DRY DENSITY LB/CU FT	γd_o	107	108	106	107
	SATURATION, %	S_o	74	76	73	74
	VOID RATIO	e_o	.562	.548	.570	.560
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.64	4.02	4.55	6.18
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	17	24	23	23
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	2.9	3.0	2.9	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (95% γ, w)

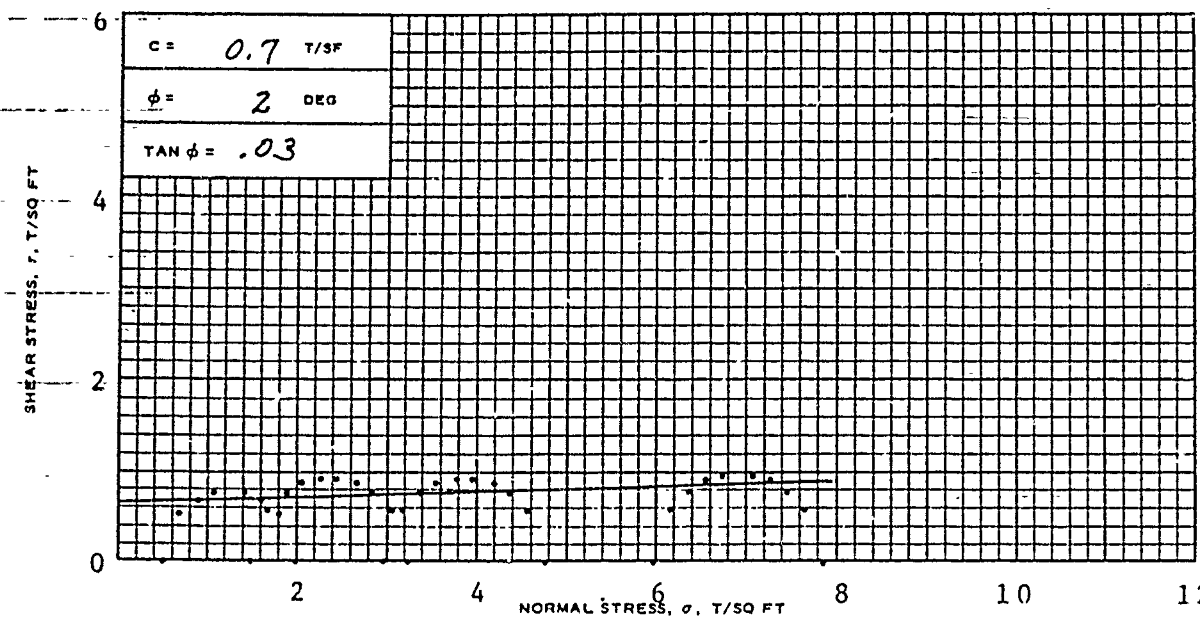
LL 35	PL 18	PI 17	G 2.69 est.	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

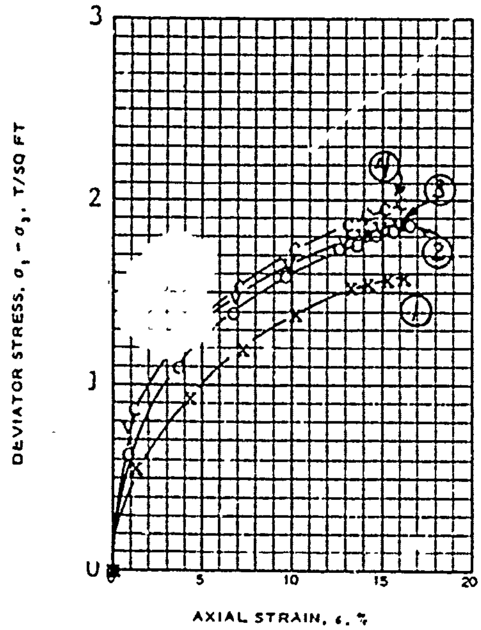
REMARKS:

PROJECT	Dierks Dam 95%
BORING NO. Quarry	SAMPLE NO. X-15011
DEPTH/ELEV	
LABORATORY SWD	DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089
REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





SPECIMEN NO.		—	1	2	3	4
INITIAL	WATER CONTENT, %	w_o	18.9	18.9	19.2	19.2
	DRY DENSITY LB/ CU FT	γd_o	107	108	106	107
	SATURATION, %	S_o	91	92	89	91
	VOID RATIO	e_o	.558	.553	.576	.567
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.56	1.82	1.85	1.95
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	23	23	22	24
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN		D_o	1.4	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	2.9	3.0	2.9	2.9

CONTROLLED- Strain TEST

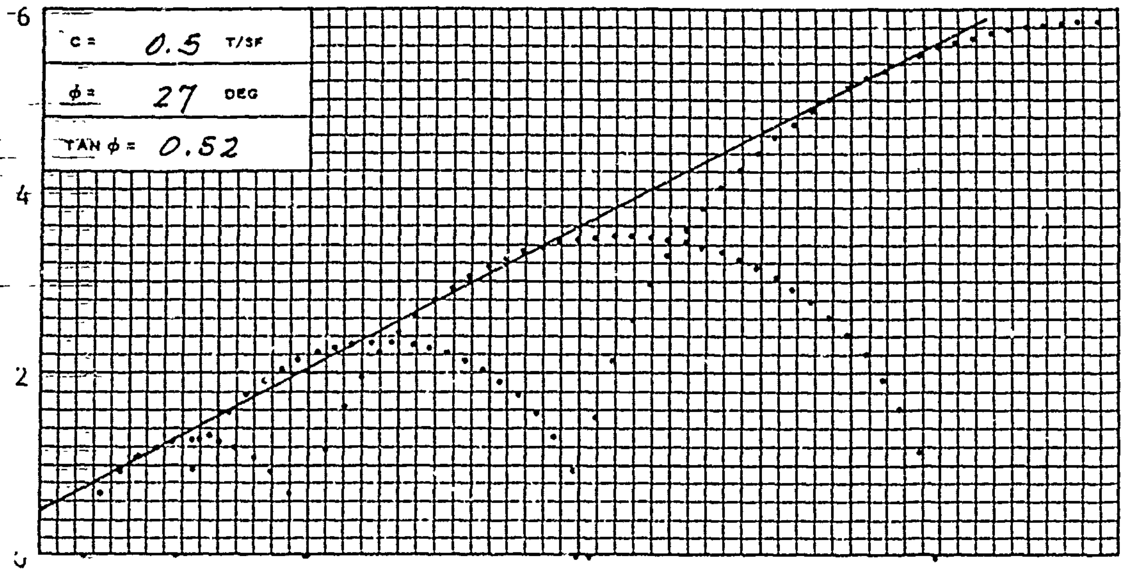
DESCRIPTION OF SPECIMENS Clayey SAND (SC) (Remolded 95%γ, w+3)

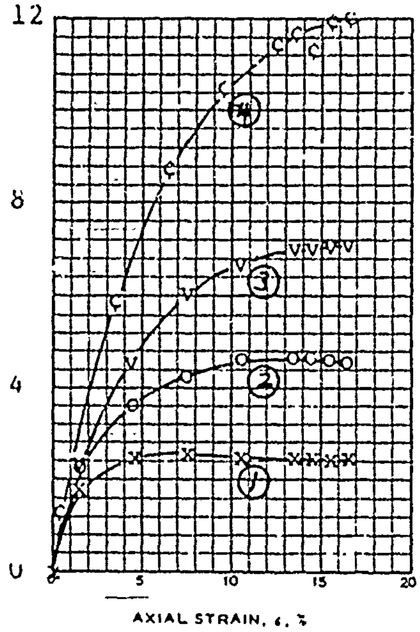
LL 35	PL 18	PI 17	G_s 2.69 est.	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

REMARKS.	PROJECT Dierks Dam 95°
	BORING NO. Quarry — SAMPLE NO. X-15011
	DEPTH/ELEV
	LABORATORY SWD — DATE SEP 71
	TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 — PREVIOUS EDITION IS OBSOLETE — TRANSLUCENT

Plate No. 18





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	9.2	9.2	9.2	9.1
	DRY DENSITY LB/CU FT	γd_o	108	108	107	107
	SATURATION, %	S_o	45	45	44	44
	VOID RATIO	e_o	.538	.540	.556	.553
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.54	4.69	7.03	11.84
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	13	21	24	24
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.3	1.3	1.3
INITIAL HEIGHT, IN.		H_o	2.9	3.0	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, W-3)

LL 24	PL 15	PI 9	Gs 2.68 est.	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

90%

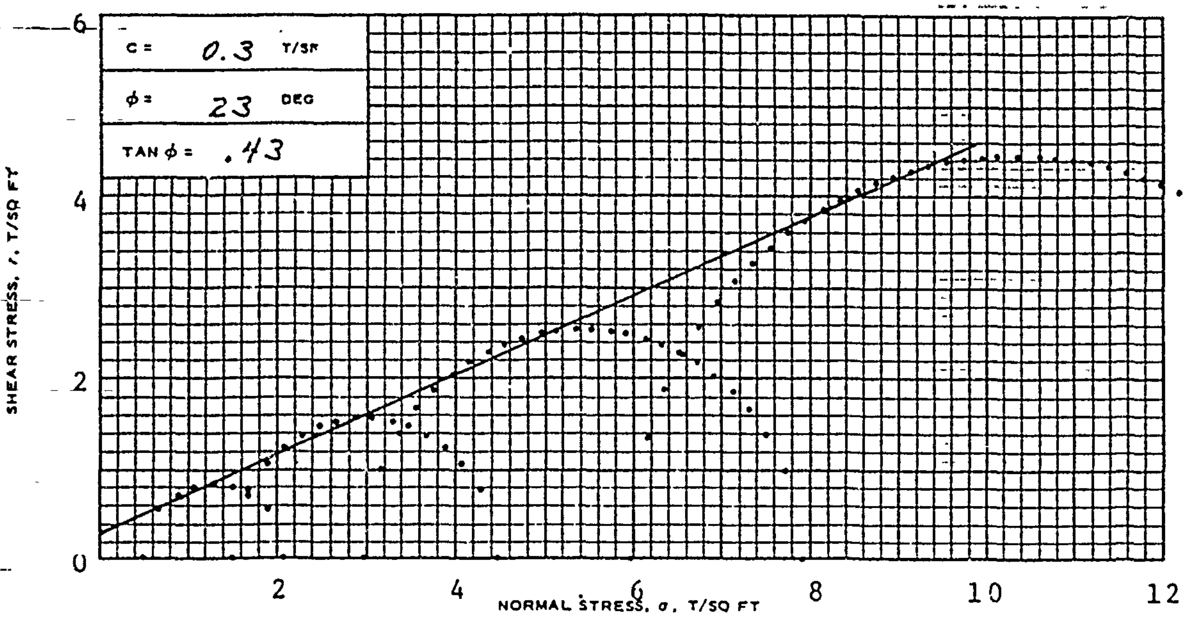
BORING NO. Test fill | SAMPLE NO. X-15017C

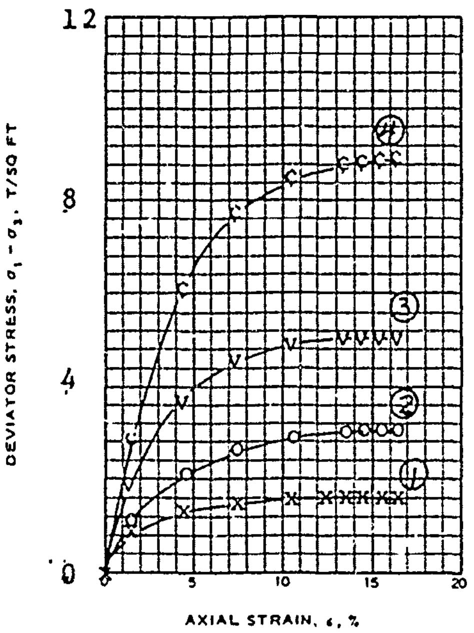
DEPTH/ELEV

LABORATORY SWD | DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089
REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	12.0	11.8	11.7	11.8
	DRY DENSITY LB/CU FT	γd_o	105	107	109	108
	SATURATION, %	S_o	54	57	59	59
	VOID RATIO	e_o	.587	.550	.527	.535
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.64	3.05	5.02	8.88
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	21	24	22	24
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN		D_o	1.3	1.3	1.3	1.3
INITIAL HEIGHT, IN		H_o	2.9	2.9	2.9	3.0

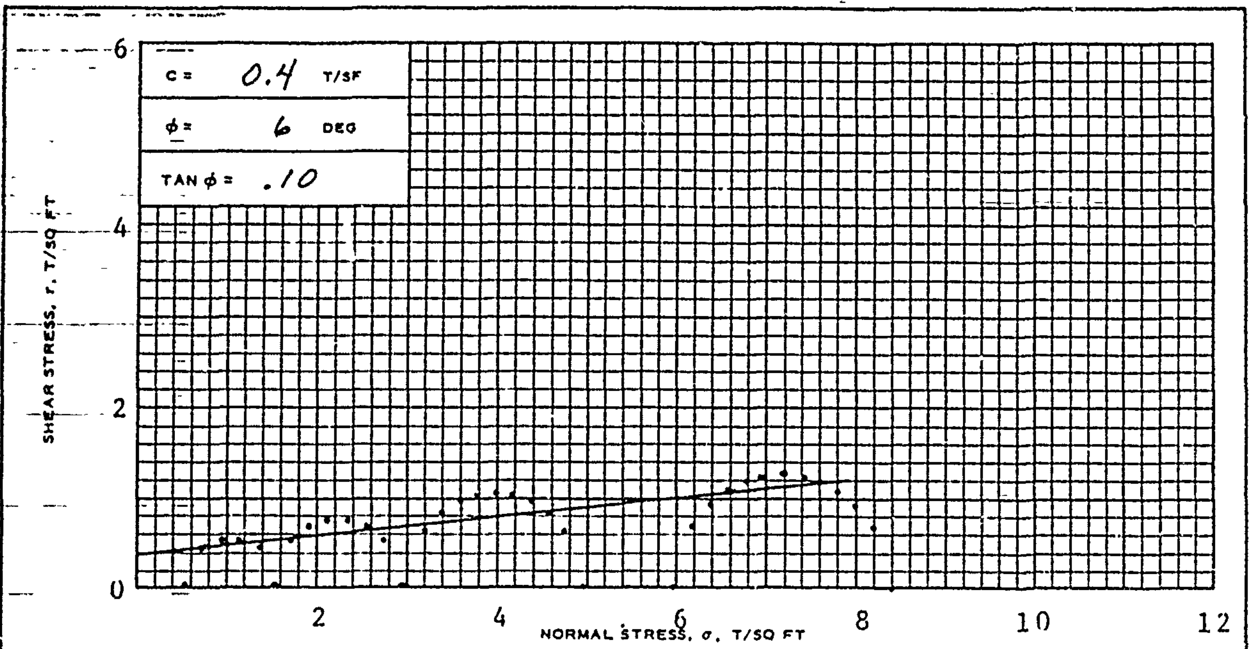
CONTROLLED- Strain TEST

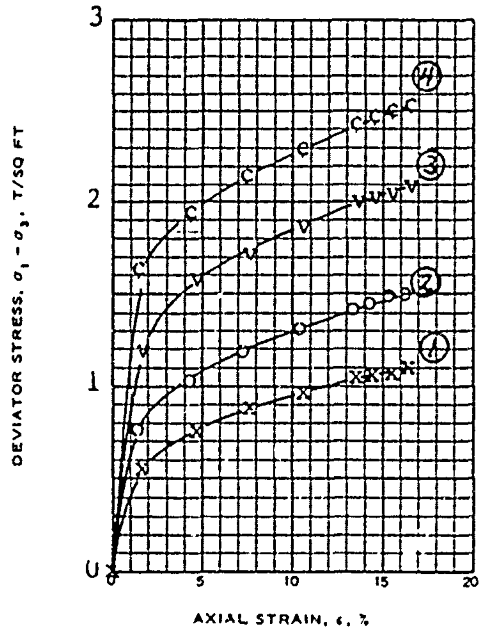
DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, w)

LL 24	PL 15	PI 9	GS 2.68 est.	TYPE OF SPECIMEN	Remolded	TYPE OF TEST	Q
REMARKS:				PROJECT	Dierks Dam 90%		
				BORING NO.	Test fill	SAMPLE NO.	X-15017C
				DEPTH/ELEV			
				LABORATORY	SWD	DATE	SEP 71
				TRIAXIAL COMPRESSION TEST REPORT			

ENG FORM NO. 2089 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT
REV JUNE 1970

Plate No. 20





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	15.1	14.9	15.0	15.1
	DRY DENSITY LB/CU FT	γd_o	108	108	108	108
	SATURATION, %	S_o	75	74	73	74
	VOID RATIO	e_o	.539	.538	.545	.540
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.05	1.47	2.02	2.48
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	24	23	23	23
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN		D_o	1.4	1.4	1.3	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (90% γ, w+3)

LL 24	PL 15	PI 9	Gs 2.68 est.

TYPE OF SPECIMEN Remolded

TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

90%

BORING NO. Test fill

SAMPLE NO. X-15017C

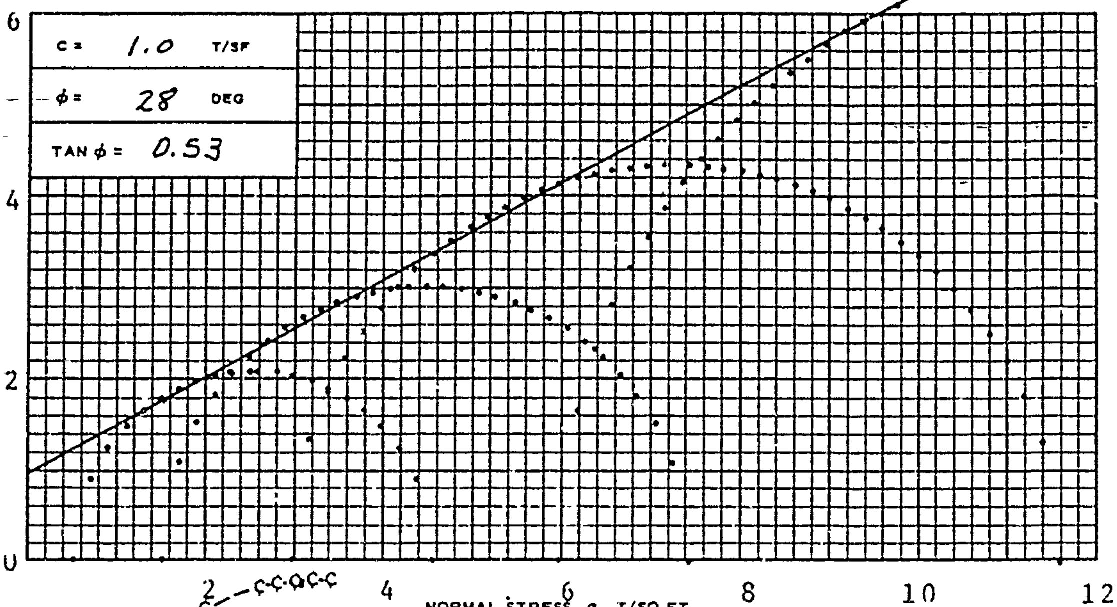
DEPTH/ELEV

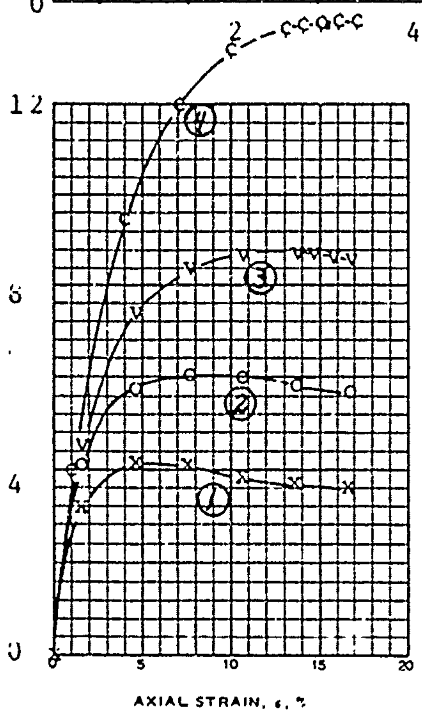
LABORATORY SWD

DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	9.4	9.1	9.0	9.1
	DRY DENSITY LB/CU FT	γd_o	114	113	114	114
	SATURATION, %	S_o	54	52	52	52
	VOID RATIO	e_o	.462	.468	.463	.467
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	4.14	6.02	8.70	13.73
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	9	12	21	24
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	2.9	2.9	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND, (SC) Remolded (95% γ, w-3)

LL 24 | PL 15 | PI 9 | Gs 2.68 est.

TYPE OF SPECIMEN Remolded | TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

95%

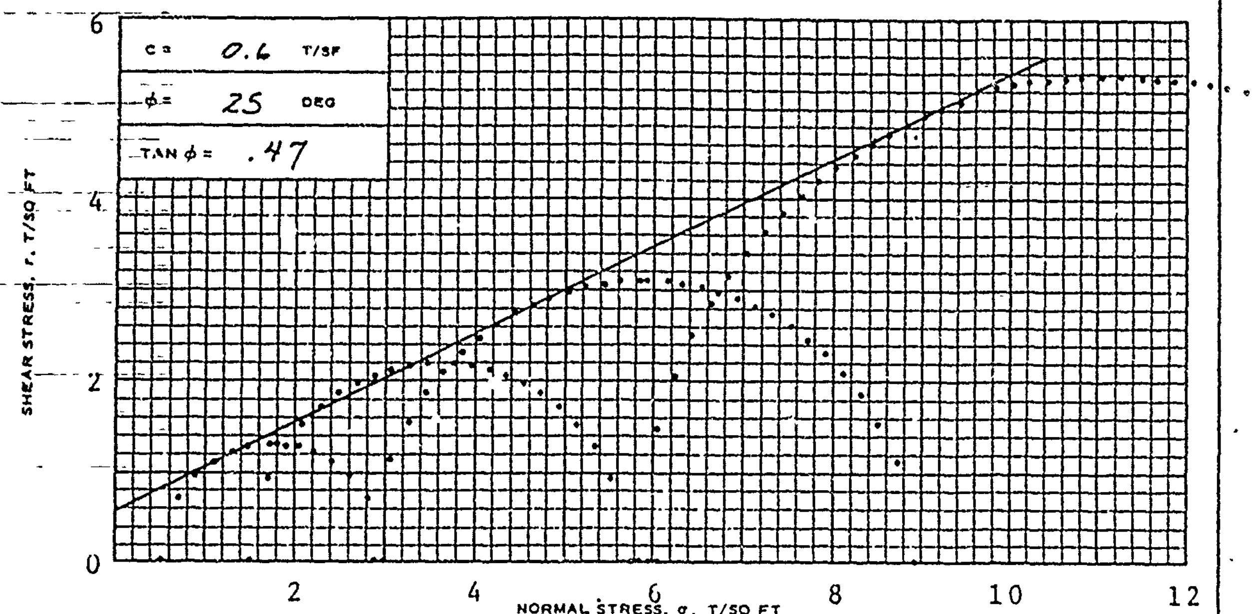
BORING NO. Test fill | SAMPLE NO. X-150170

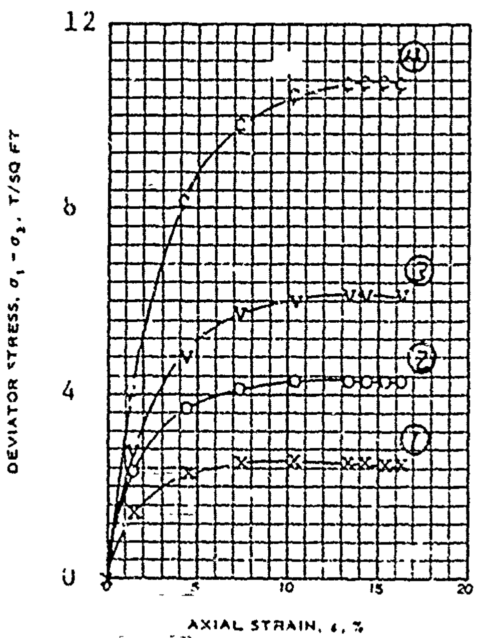
DEPTH/ELEV

LABORATORY SWD | DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089
REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	11.9	12.1	11.7	11.8
	DRY DENSITY LB/CU FT	γ_{d_o}	115	115	115	114
	SATURATION, %	S_o	71	72	70	69
	VOID RATIO	e_o	.447	.448	.445	.457
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γ_{d_c}				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	2.56	4.32	6.14	10.69
TIME TO $(\sigma_1 - \sigma_3)_{max}$, MIN		t_f	17	23	23	24
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ult}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.3	1.3	1.3
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (95% γ, w)

LL 24	PL 15	PI 9	Gs 2.68 est.	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam 95%

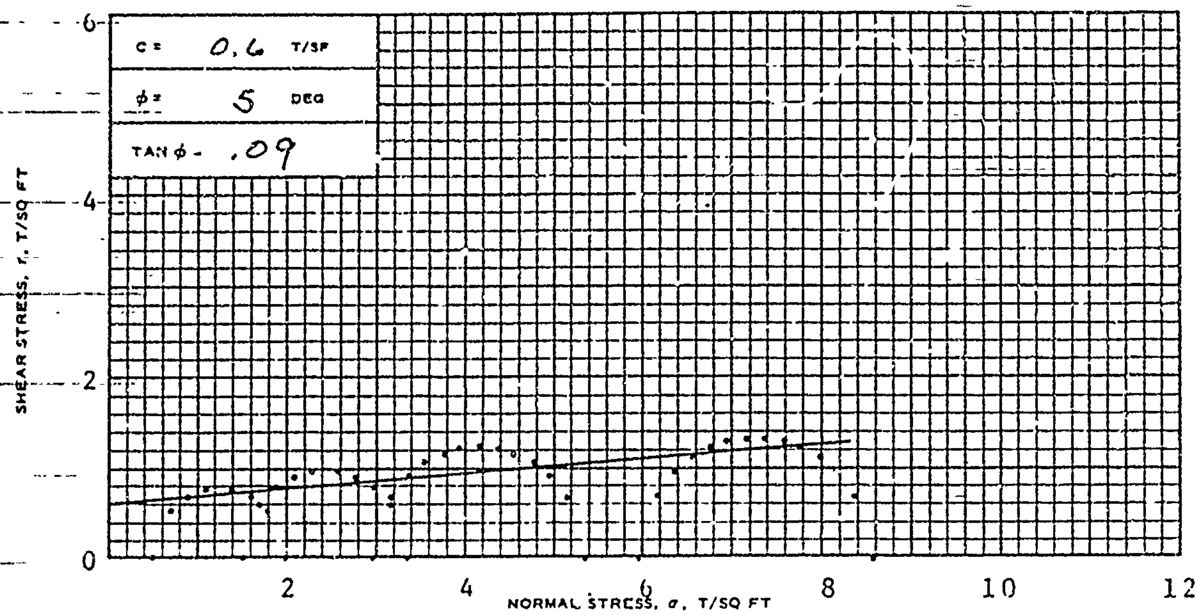
BORING NO. Test fill | SAMPLE NO. X-15017C

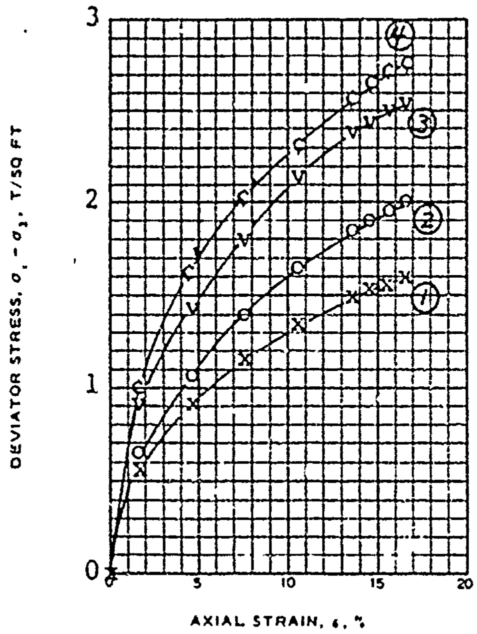
DEPTH/ELEV

LABORATORY SWD | DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2069 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	15.3	15.2	15.1	15.3
	DRY DENSITY LB/ CU FT	γd_o	114	115	115	114
	SATURATION, %	S_o	90	90	90	89
	VOID RATIO	e_o	.455	.452	.448	.460
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.54	1.92	2.54	2.66
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	20	23	23	22
ULTIMATE DEVIATOR STRESS, T SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.0	2.9	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Clayey SAND (SC) Remolded (95% γ, W+3)

LL 24	PL 15	PI 9	G_s 2.68 est.	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

95%

BORING NO. Test fill

SAMPLE NO. X-15017C

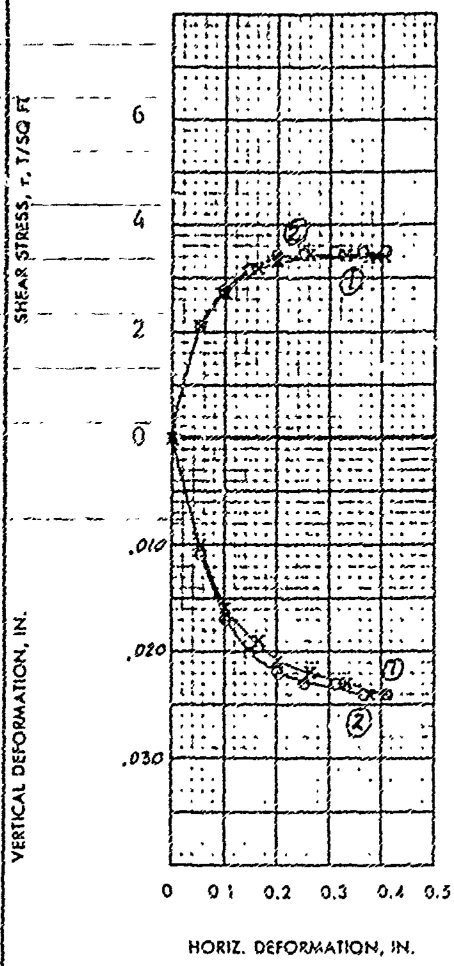
DEPTH/ELEV

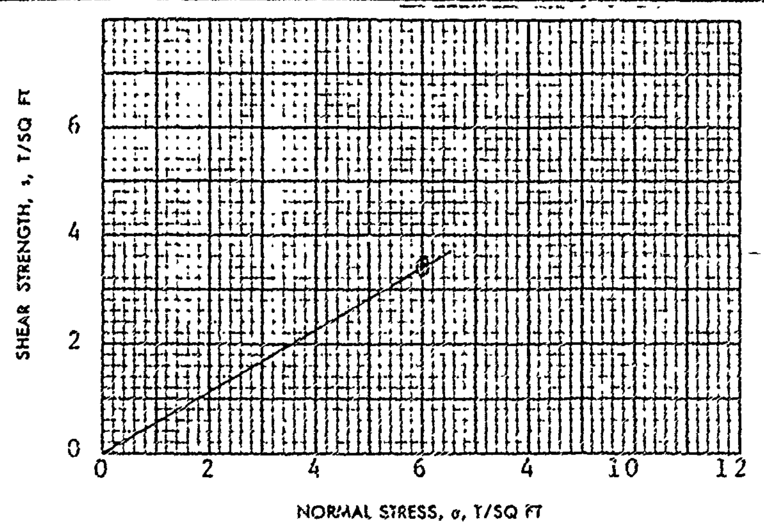
LABORATORY SWD

DATE SEP 71

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089
REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	13.6%	13.5%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	101	101		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	17.6%	17.9%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.38	3.44		
ACTUAL TIME TO FAILURE, MIN		t_f	330	310		
RATE OF STRAIN, IN./MIN			.001	.001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 30°

TAN ϕ' = 0.57

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded (90% γ, w-3) 3.0 IN. SQUARE 0.5 IN. THICK

CLASSIFICATION Clayey SAND (SC)

LL 35 PL 18 PI 17 G_s

REMARKS

PROJECT DIERKS DAM

90%

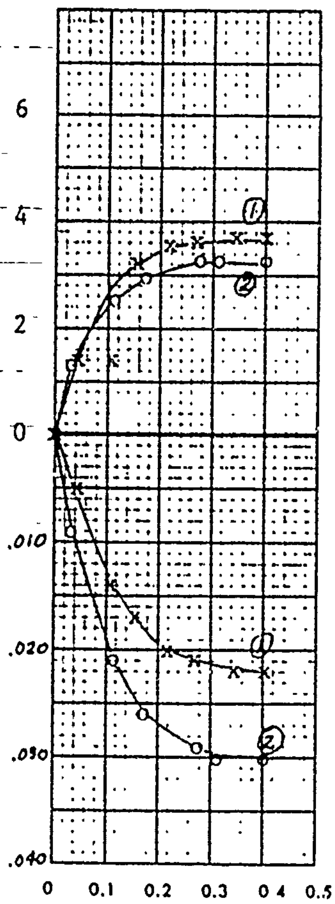
AREA

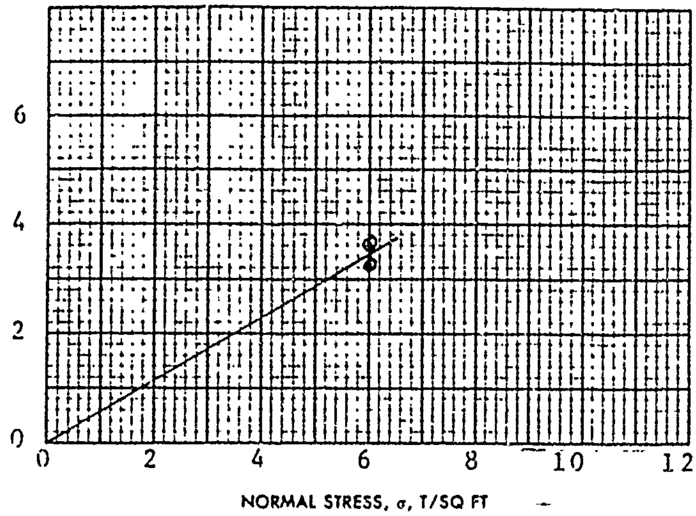
BORING NO Quarry SAMPLE NO X-15011

DEPTH EL DATE SEP 71

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO : 1968 OF—214-945 PLATE IX-3





SHEAR STRENGTH PARAMETERS

ϕ' = 30°

TAN ϕ' = 0.57

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

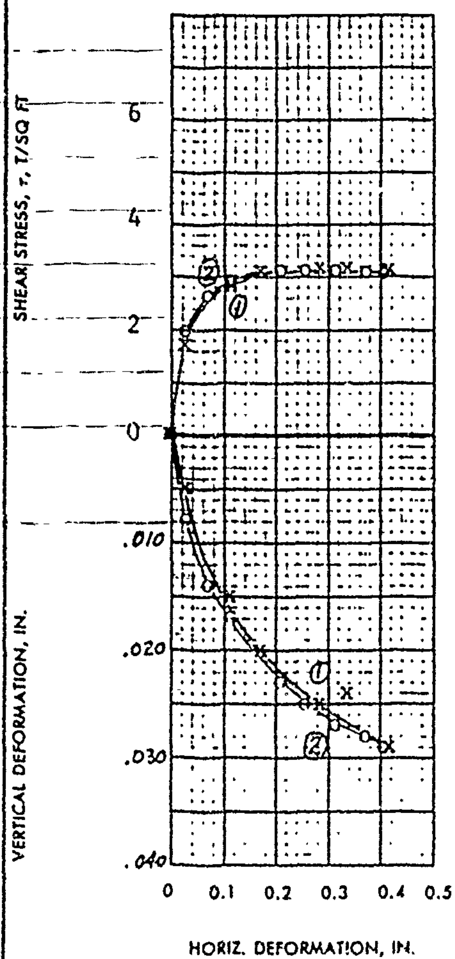
			1	2	3	
TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	16.1%	15.9%	%	%
INITIAL	VOID RATIO	e_o				
INITIAL	SATURATION	S_o	%	%	%	%
INITIAL	DRY DENSITY, LB/CU FT	γ_d	101	101		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	18.6%	16.5%	%	%
FINAL	VOID RATIO	e_f				
FINAL	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.64	3.24		
ACTUAL TIME TO FAILURE, MIN		t_f	4260	3150		
RATE OF STRAIN, IN./MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

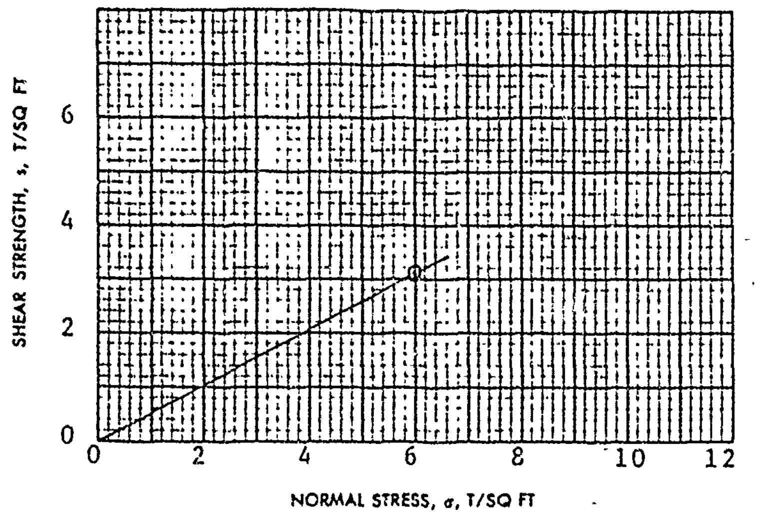
TYPE OF SPECIMEN Remolded (90% γ, w)	3.0 IN. SQUARE	.5 IN. THICK	
CLASSIFICATION Clayey SAND (SC)			
LL 35	PL 18	PI 17	G_s

REMARKS

PROJECT DIERKS DAM	
90%	
AREA	
BORING NO. Quarry	SAMPLE NO. X-15011
DEPTH EL	DATE SEP 71

DIRECT SHEAR TEST REPORT





SHEAR STRENGTH PARAMETERS

ϕ' = 28°

TAN ϕ' = 0.52

c' = 0.0 T/SQ FT

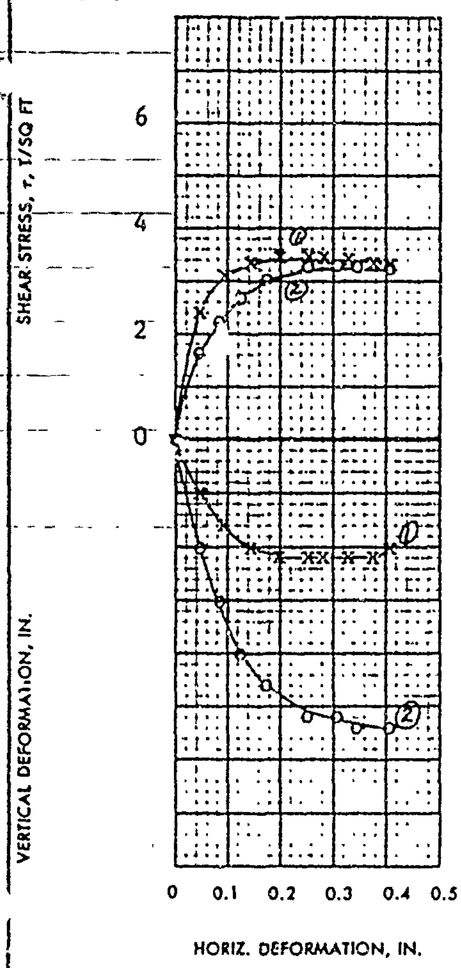
☐ CONTROLLED STRESS

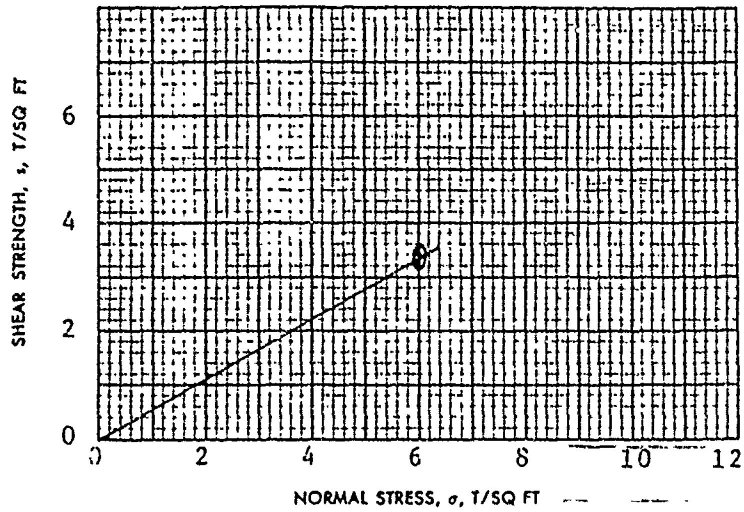
☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	18.8 %	18.7 %	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	102	102		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	19.1 %	17.4 %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.11	3.06		
ACTUAL TIME TO FAILURE, MIN		t_f	2850	2850		
RATE OF STRAIN, IN./MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN	Remolded (90% γ, w+3)	3.0	IN. SQUARE	.5	IN. THICK
CLASSIFICATION	Clayey SAND (SC)				
LL 35	PL 18	PI 17		G.	

REMARKS	PROJECT DIERKS DAM
	90%
	AREA
	BORING NO. Quarry — SAMPLE NO X-15011
	DEPTH EL — DATE SEP 71
	DIRECT SHEAR TEST REPORT





TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	13.6 %	13.7 %	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	107	107		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	17.2 %	17.7 %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.41	3.26		
ACTUAL TIME TO FAILURE, MIN		t_f	250	250		
RATE OF STRAIN, IN /MIN			.001	.001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

ϕ' = 29°

TAN ϕ' = 0.56

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TYPE OF SPECIMEN	Remolded (95% γ, W-3)	3.0 IN. SQUARE	.5 IN. THICK
CLASSIFICATION	Clayey SAND (SC)		
LL 35	PL 18	PI 17	G_s .00

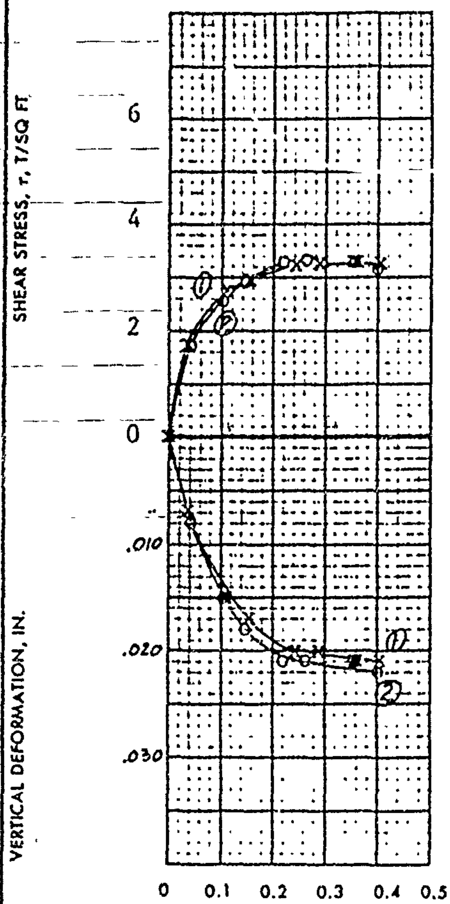
REMARKS

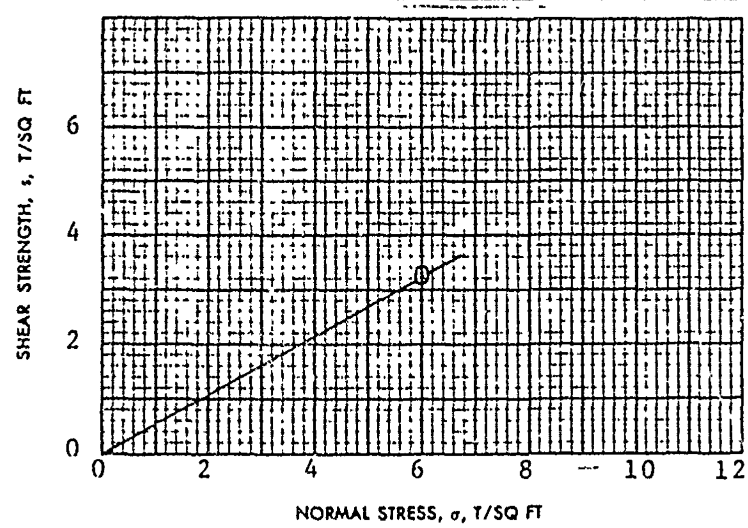
PROJECT	DIERKS DAM 95%		
AREA			
BORING NO	Quarry	SAMPLE NO.	X-15011
DEPTH EL		DATE	SEP 71

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO : 1966 O7—214-945





SHEAR STRENGTH PARAMETERS

ϕ' = 28°

TAN ϕ' = 0.54

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

			1	2	3	
INITIAL	WATER CONTENT	w_o	15.8%	16.1%	%	%
INITIAL	VOID RATIO	e_o	.			
INITIAL	SATURATION	S_o	%	%	%	%
INITIAL	DRY DENSITY, LB/CU FT	γ_d	107	107		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	18.3%	17.8%	%	%
FINAL	VOID RATIO	e_f				
FINAL	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.23	3.27		
ACTUAL TIME TO FAILURE, MIN		t_f	4400	3250		
RATE OF STRAIN, IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded (95% γ, w) 3.0 IN. SQUARE .5 IN. THICK

CLASSIFICATION Clayey SAND (SC)

LL 35 | PL 18 | PI 17 | G_s .00

REMARKS

PROJECT DILRKS DAN

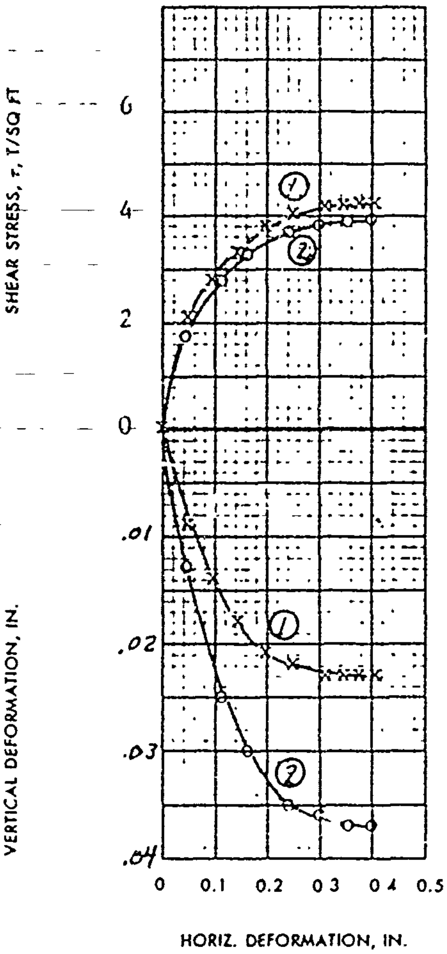
95%

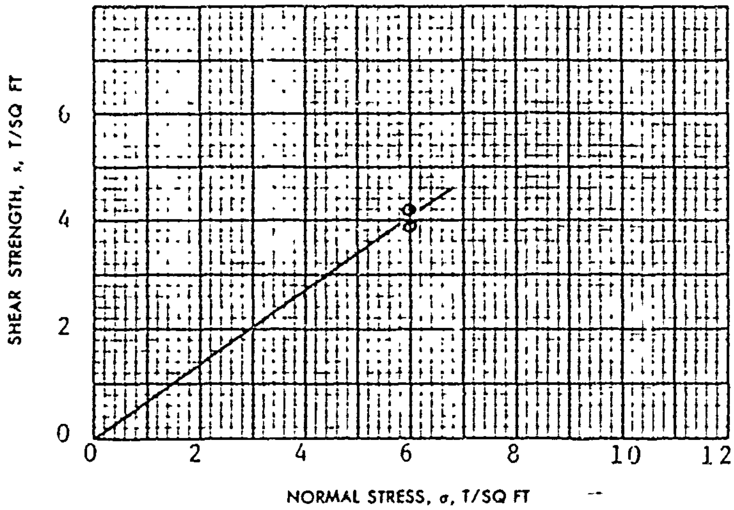
AREA

BORING NO. Quarry | SAMPLE NO. X-15011

DEPTH EL | DATE SEP 71

DIRECT SHEAR TEST REPORT





SHEAR STRENGTH PARAMETERS

ϕ' = 34

TAN ϕ' = 0.67

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	9.3%	9.2%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	106	108		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	14.2%	13.0%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	4.20	3.87		
ACTUAL TIME TO FAILURE, MIN		t_f	380	410		
RATE OF STRAIN, IN./MIN			.001	.001		
ULTIMATE SHEAR STRESS T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN	Remolded (90% γ, w-3)	3.0 IN. SQUARE	.5 IN. THICK	
CLASSIFICATION	Clayey SAND (SC)			
LL 24	PL 15	PI 9		G. ~~.00~~

REMARKS

PROJECT DIERKS DAM

90%

AREA

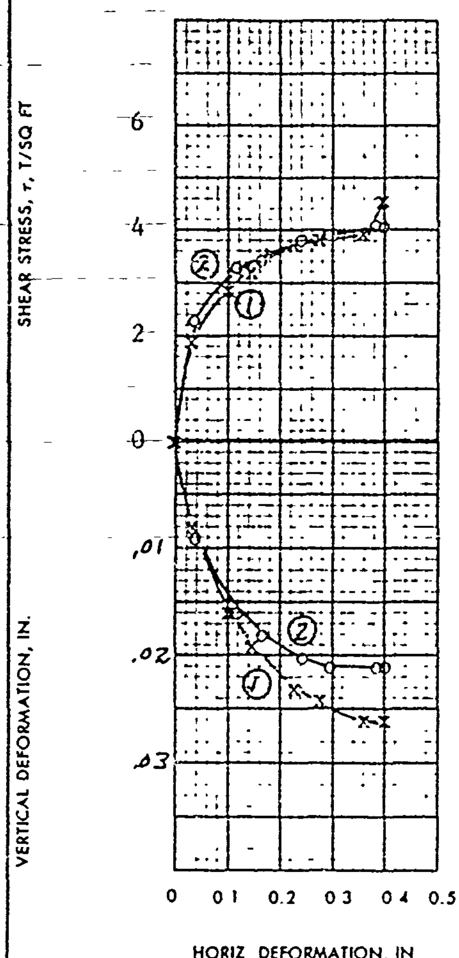
BORING NO. Test fill

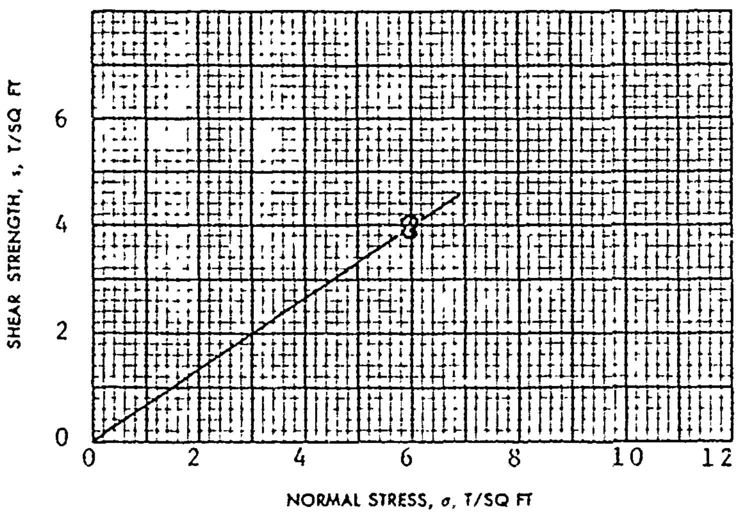
SAMPLE NO. X-15017C

DEPTH EL

DATE SEP 71

DIRECT SHEAR TEST REPORT





SHEAR STRENGTH PARAMETERS

ϕ' = 34

TAN ϕ = 0.66

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☑ CONTROLLED STRAIN

TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	12.6 %	12.1 %	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	107	108		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	13.7 %	13.9 %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.90	4.04		
ACTUAL TIME TO FAILURE, MIN		t_f	4300	4400		
RATE OF STRAIN, IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded (90% γ, w) 3.0 IN SQUARE .5 IN THICK

CLASSIFICATION Clayey SAND (SC)

LL 24 | PL 15 | PI 9 | G_s .00

REMARKS

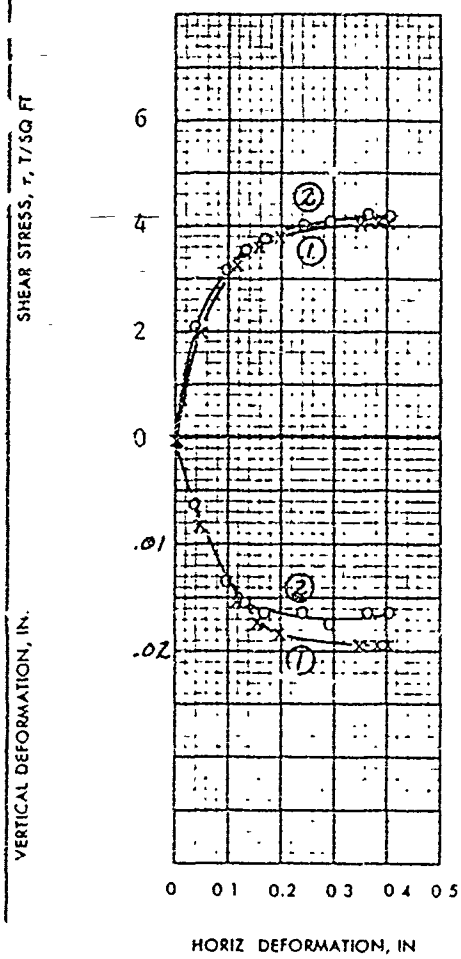
PROJECT DIERKS DAM 90%

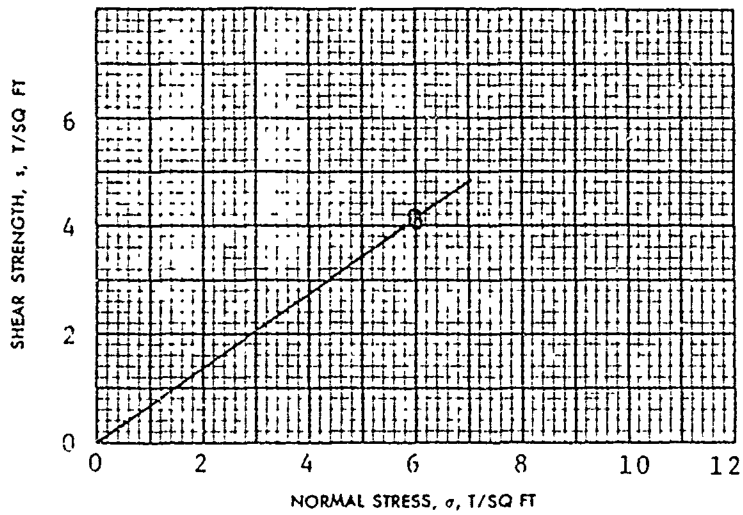
AREA

BORING NO Test fill | SAMPLE NO X-15017C

DEPTH EL | DATE SEP 71

DIRECT SHEAR TEST REPORT





SHEAR STRENGTH PARAMETERS

ϕ = 35

TAN ϕ' = 0.69

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	15.3%	15.2%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	108	108		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	14.9%	13.0%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	4.05	4.21		
ACTUAL TIME TO FAILURE, MIN		t_f	4500	4300		
RATE OF STRAIN, IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded (90% γ, w+3) 3.0 IN SQUARE .5 IN THICK

CLASSIFICATION Clayey SAND (SC)

LL 24 PL 15 PI 9 G_s .00

REMARKS

PROJECT DIERKS DAM

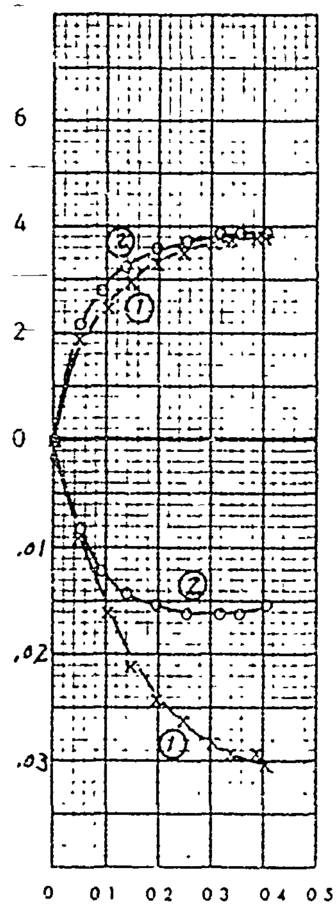
90%

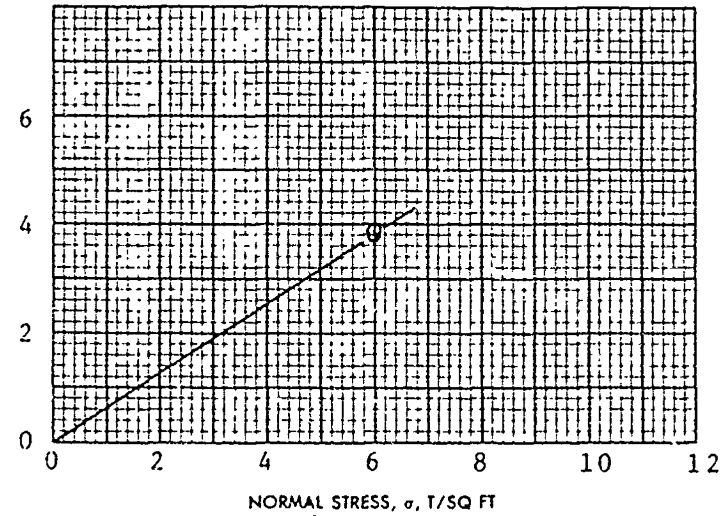
AREA

BORING NO Test fill SAMPLE NO X-15017C

DEPTH EL DATE SEP 71

DIRECT SHEAR TEST REPORT





SHEAR STRENGTH PARAMETERS

ϕ' = 33

TAN ϕ = 0.64

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

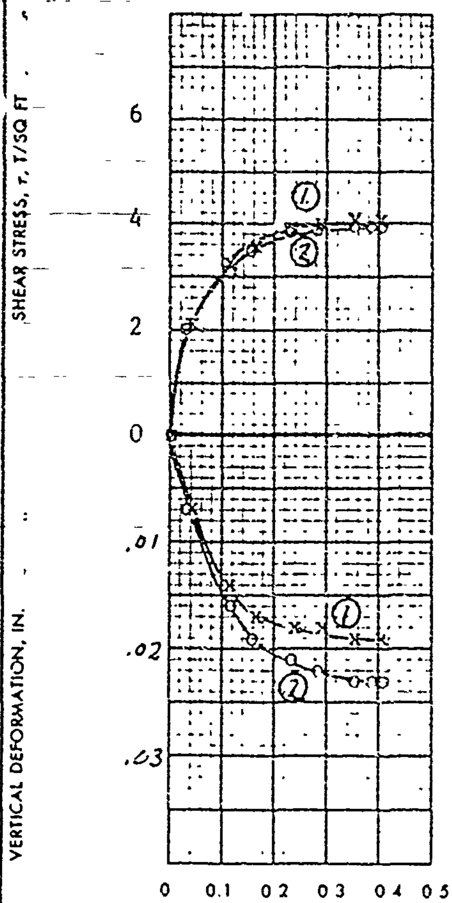
TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	9.3%	9.4%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	114	114		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	14.1%	14.1%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	3.79	3.88		
ACTUAL TIME TO FAILURE, MIN		t_f	400	350		
RATE OF STRAIN, IN / MIN			.001	.001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

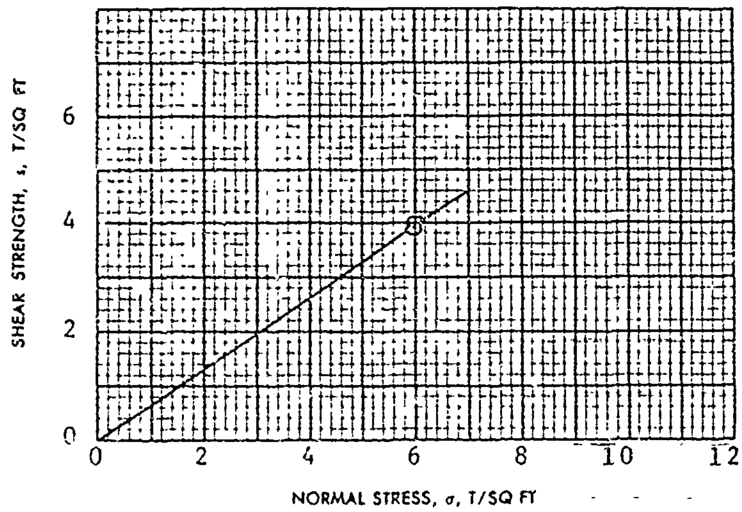
TYPE OF SPECIMEN Remolded (95% γ, w-3)	3.0 IN. SQUARE	.5 IN. THICK		
CLASSIFICATION Clayey SAND (SC)				
LL 24	PL 15	PI 9		G_s .00

REMARKS

PROJECT	DIERKS DAM
	95%
AREA	
BORING NO Test fill	SAMPLE NO X-15017C
DEPTH EL	DATE SEP 71

DIRECT SHEAR TEST REPORT





SHEAR STRENGTH PARAMETERS

ϕ' = 33

TAN ϕ = 0.66

c' = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

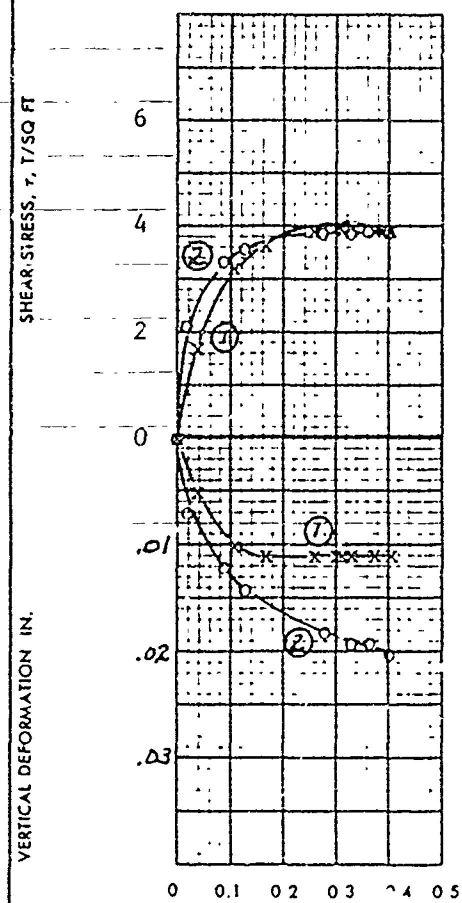
TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	12.2%	12.1%	%	%
	VOID RATIO	e_o				
	SATURATION	S_o	%	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	114	114		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	13.8%	13.4%	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	6.0	6.0		
MAXIMUM SHEAR STRESS T/SQ FT		τ_{max}	4.00	3.89		
ACTUAL TIME TO FAILURE MIN		t_f	4300	4500		
RATE OF STRAIN, IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

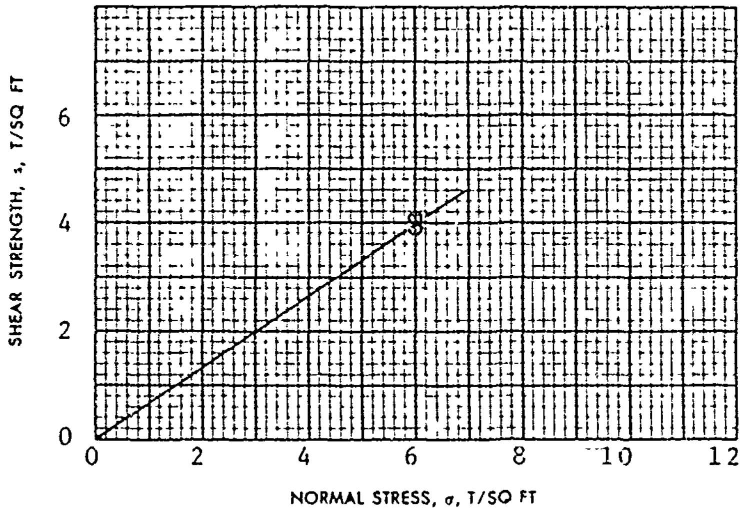
TYPE OF SPECIMEN Remolded (95% γ, w)	3.0 IN SQUARE	.5 IN THICK	
CLASSIFICATION Clayey SAND (SC)			
LL 24	PL 15	PI 9	G. .00

REMARKS

PROJECT	DIERKS DAM
	95%
AREA	
BORING NO Test fill	SAMPLE NO X-15017C
DEPTH EL	DATE SEP 71

DIRECT SHEAR TEST REPORT





SHEAR STRENGTH PARAMETERS

ϕ = 34

TAN ϕ = 0.66

c = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO		1	2	3	
INITIAL WATER CONTENT	w_o	15.3%	15.3%	%	%
INITIAL VOID RATIO	e_o				
INITIAL SATURATION	S_o	%	%	%	%
INITIAL DRY DENSITY, LB/CU FT	γ_d	114	114		
VOID RATIO AFTER CONSOLIDATION	e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN	t_{50}				
FINAL WATER CONTENT	w_f	13.8%	14.2%	%	%
FINAL VOID RATIO	e_f				
FINAL SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT	σ	6.0	6.0		
MAXIMUM SHEAR STRESS, T/SQ FT	τ_{max}	4.07	3.87		
ACTUAL TIME TO FAILURE, MIN	t_f	4300	4300		
RATE OF STRAIN IN/MIN		.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT	τ_{ult}				

TYPE OF SPECIMEN Remolded (95% γ, w+3)		3.0 IN SQUARE	.5 IN THICK
CLASSIFICATION Clayey SAND (SC)			
LL 24	PL 15	PI 9	G_s .00

REMARKS

PROJECT DIERKS DAM

95%

AREA

BORING NO Test fill | SAMPLE NO X-15017C

DEPTH EL | DATE SEP 71

DIRECT SHEAR TEST REPORT

APPENDIX C

SWDED - GL REPORT NO. 11332

DATED 13 JULY 1972

APPENDIX V

SWDED-GL REPORT NO. 11332
DATED 13 JULY 1972

REQUEST FOR AND RESULTS OF TESTS

PAGE NO 1 | NO OF PAGES 28

SECTION A - REQUEST FOR TEST TU-FM-72-20, 14 Feb 72 and Supp 1, 22 Feb 72

1 TO: (Include ZIP Code)	2 FROM: (Include ZIP Code)
Southwestern Division Laboratory US Army Engineer Division, Southwestern Corps of Engineers 4815 Cass Street Dallas, Texas 75235	Chief Fdn & Matls Branch Tulsa District
3 PRIME CONTRACTOR AND ADDRESS (Include ZIP Code) CONTRACT NUMBER	4 MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code) P O NUMBER

5 END ITEM AND/OR PROJECT	6 SAMPLE NUMBER	7 LOT NO	8 REASON FOR SUBMITTAL	9 DATE SUBMITTED
Dierks Dam				

10 MATERIAL TO BE TESTED	10a QUANTITY SUBMITTED	11 QUANTITY REPRESENTED	12 SPEC. & AMEND AND/OR DRAWING NO & REV FOR SAMPLE & DATE
Shale Material	Two Bag Samples (3 bags each)		

13 PURCHASED FROM OR SOURCE	14 SHIPMENT METHOD	15 DATE SAMPLED AND SUBMITTED BY
Spillway Quarry	Govt Vehicle	

16 REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS

17 SEND REPORT OF TEST TO

Tulsa Dist Ofc

SECTION B - RESULTS OF TEST (Continue on plain white paper if more space is required)

1 DATE SAMPLE RECEIVED	2 DATE RESULTS REPORTED	3 LAB REPORT NUMBER
2 February 1972	13 July 1972	SWDED-GL 11332

4 TEST PERFORMED	RESULTS OF TEST	SAMPLE RESULT	REQUIREMENTS

See following pages.

This completes the requested testing.

DATE	TYPED NAME AND TITLE	SIGNATURE
13 Jul 72	HUGH E. GARRISON Director Southwestern Division Laboratory	[signature]

DD FORM 1 FEB 62 1222 REPLACES DD FORM 1222 1 JUL 58 WHICH IS OBSOLETE.

SWDED-GL Report No. 11332 13 July 1972

Results of Tests of Shale Material
Spillway Quarry
Dierks Dam - Tulsa District

1. Reference:

a. Test Request TU-FM-72-20 dated 14 February 1972, and Supplement No. 1 thereto dated 22 February 1972.

b. SWDED-GL Report No. 11227 dated 29 September 1971.

2. Two samples consisting of three bags each, marked Quarry 1 and Quarry 2, were received 2 February 1972, and were assigned SWD Nos. X-15623 and X-15624. Four bags (two of each sample) were combined for testing and the remaining two bags saved in their "as-received" condition for subsequent X-ray diffraction, slaking tests, accelerated expansion tests and megascopic examination.

3. The four composited samples were crushed to pass the No. 10 screen after an examination of the materials indicated that individual particle sizes were much smaller.

4. Atterberg limits tests were conducted on the minus ? fraction of the as-crushed material, on the material after 10 minutes of blenderizing, and after 30 minutes of blenderizing. Liquid limits were 25, 33 and 35, respectively. Gradation curves corresponding to each treatment are shown on Plate 1. A standard compaction test performed on the as-crushed material gave data shown on Plate 2.

5. Q triaxial specimens were remolded to densities near 90 and 95% of maximum density from the compaction test, at water contents of optimum and optimum -3%. Test data and results are shown on Plates 3 through 6.

6. R triaxial specimens were remolded to densities near 95 and 100% of maximum density from the compaction test, at water contents of optimum and optimum -3%. Test data and results are shown on Plates 7 through 10.

7. S direct shear specimens were remolded to densities near 90 and 95% of maximum density, at water contents of optimum and optimum -3%. Two specimens at each remolded condition were tested under normal stress of 8 T/sq ft, and strength envelopes drawn between the average strength value and the origin. Test data and results are shown on Plates 11 through 14.

8. In addition to the tests of the bag samples received 2 February 1972, R tests were performed on SWD Sample X-15011, received 20 August 1971, and previously tested for Q and S strengths (SWDED-GL Report 11227, 29 September 1971). Specimens were remolded to near 95% and 100% maximum density, at

Results of Tests of Shale Material
Spillway Quarry
Dierks Dam - Tulsa District
(Cont'd)

water contents of about optimum and optimum -3%. Test data and results are shown on Plates 15 through 18. Strength values agree closely with those obtained in tests of the new material.

9. The two bag samples which were saved in the "as-received" condition were combined and the pieces subjected to megascopic examination. (See Petrographic Report). In general, three materials appeared present: shale, an intermediate material initially designated silty shale, and shaly sandstone. Typical specimens of the shale and sandstone were submitted to Dr. A. J. Ehlmann, Texas Christian University, for X-ray analysis; his report is included at the conclusion of the text. The X-ray diffractograms are inclosed in an envelope inside the back cover of the originals of this report.

10. Specimens of each of the three materials were subjected to five cycles of slaking in distilled water and oven-drying. Photographs were taken before the tests were begun, at the end of the first slaking (before oven-drying) and after the third and fifth cycles; the photographs are found on Plate 20. The shale specimens began to disintegrate within minutes of the first immersion in water; the silty shale was affected to varying degrees; and the shaly sandstone was affected almost not at all. Atterberg limits tests were performed on a portion of the shale material after the slaking-drying test: liquid limit 41, plastic limit 21, plasticity index 20.

SWD Form 600-B Reinstated 4 May 59	PETROGRAPHIC REPORT	Corps of Engineers SWD Testing Laboratory Dallas, Texas	
Report No. SWDGL 11332	Project Dierks Dam	Date 13 Jul 72	Initial GHH
Sample No.	Source See paragraph 2 below		

1. References. Reference is made to Tulsa District Test Request No. TU-FM-72-20 dated 14 February 1972 and to Supplement No. 1 dated 22 February 1972, requesting petrographic analysis and accelerated expansion tests on the sample described below.

2. Samples. Samples consisted of two bags of chunk rock from the spillway quarry selected at random from the six bags submitted. Chunk size ranged up to 11" x 6" x 5". The samples for petrographic examination, X-ray diffraction, accelerated expansion tests and slaking tests were selected from this portion of the total sample.

3. Description. The material from each bag was examined separately and divided into three types as noted below:

Type	Percent Bag 1	Bag 2	Total
Shale	26	0	14
Silty Shale	7	42	24
Sandstone	67	57	62

a. The shale was black, soft and fissile with occasional thin stringers of very fine-grained sandstone. Some iron staining was noted. Simple staining tests with benzidine indicated the presence of a small percent of swelling-type clays although X-ray diffraction did not show this. This material broke down readily in both the accelerated expansion test (Plate 19) and in the slaking test (Plate 20).

b. The silty shale was dark gray and moderately hard. Thin, randomly oriented, carbonaceous inclusions up to 1-1/2" in diameter were noted throughout the rock. During the slaking test some of the particles broke down during the first cycle; others retained their general outward shape, but cracked on random planes during the test period (Plate 20). The only breakdown that occurred during the accelerated expansion test was random cracking in two particles and slight spalling in two particles (Plate 19). See below for a discussion of the latter test. It was found that after a short period of soaking in water, this material could be crumbled between the fingers, and with a little effort and the addition of more water, could be completely broken down. A small sample processed in this manner and sieved over a No. 325 (0.044 mm) sieve resulted in approximately 70 percent passing the sieve. The 30 percent retained consisted predominantly of quartz with a trace of chert. Twenty percent of the material passing was clay minerals with the remaining 80 percent consisting predominantly of quartz with small percents of miscellaneous minerals. Staining tests indicated a small percent of the clay minerals to be of the swelling type.

c. The sandstone was gray, moderately hard, highly argillaceous, and fine-grained. The sand grains were subrounded to subangular, and consisted predominantly of quartz with a trace of chert and quartzite. Some of the surfaces of the rock had thin, iron-stained, shale coatings with a trace of mica. Large chunks of the rock were difficult to break with a hammer, but it was possible to break off small pieces with the fingers. The rock was only slightly affected by either slaking or accelerated expansion tests (Plates 19 and 20).

4. Accelerated Expansion Tests. These tests were performed in accordance with the procedures in CRD-C 148-69. Photographs, taken at various intervals during the test, are shown on Plate 19. Breakdown of the shale began within five minutes after submerging the sample, and continued through 24 hours. No obvious additional breakdown occurred after that time. The silty shale showed no signs of breakdown during the first two hours, after which slight cracks appeared in two particles. At 24 hours, two particles had cracks through the entire particle, and two other particles began slight spalling. Only slight additional breakdown occurred during the remainder of the test. No evidence of any breakdown of the sandstone occurred other than small deposits of sand grains around each particle. The percent loss (passing the 3/4" sieve) of each type material at the end of testing is shown below:

Rock Type	Loss, %
Shale	37.7
Silty Shale	0.9
Sandstone	0.6

TEXAS CHRISTIAN UNIVERSITY
Fort Worth, Texas 76129

Department of Geology

March 30, 1972

Director
Southwestern Division Laboratory
U. S. Army Engineer Div. Southwestern
Corps of Engineers
4815 Cass Street
Dallas, Texas 75235

Dear Sirs:

The X-ray analysis of the two samples from Dierks Dam indicated:

1. Shaley sample:
    Illite ----------------------------------50% estimated
    Kaolinite ------------------------------20% "
    Quartz ---------------------------------20% "
    Chlorite -------------------------------10% "

The sample appears to be a non-expanding black shale.

2. Sandy sample:
    Quartz ---------------------------------60% estimated
    Kaolinite ------------------------------20% "
    Illite ---------------------------------10% "
    Chlorite -------------------------------10% "

The sample appears to be a sandstone of graywacke type differing from the type only in having no feldspar with the quartz.

If I can be of additional help on interpretation, do not hesitate to call me.

Very truly yours,

A. J. Ehlmann
Professor of Geology

AJE:vf

Sheet 1 of 2

TEST DATA SUMMARY

SWDED-GL Report No. 11332

FEATURE ______________

Dierks Dam

Boring No.	Sam. No.	Depth or Elev of Sample	Laboratory Classification	Mechanical Analysis Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits LL	PL	Specific Gravity G	Nat Water Cont %	Natural Dry Density Lbs/Cu Ft	Compaction Data Opt Water %	Maximum Dry Density Lbs/Cu Ft
X-156	3 2		CL	0	16	84		33	16	2.70			12.6	117.0

Shear Data Initial e	Dry Density Lbs/Cu Ft	w_1 %	w_2 %	S_1 %	Type Test	Specimen Size Inches	Test	σ_3 T/Sq Ft	σ_1 T/Sq Ft	c T/Sq Ft	ϕ Degrees	Permeability e	k Ft/Min	Consolidation Data p_o T/Sq Ft	p_c T/Sq Ft	C_c	t_{50}	Remarks
														Approx remolded conditions				
601	105	9.6	43	43	TC Q	1.4x3.0	1	0.5	2.98	0.5	27							
609	104	9.5	42	42	-	-	2	1.5	5.96					90% max dens, opt-3%				
.586	106	9.5	43	43	-	1.4x3.0	3	3.0	9.44									
.595	105	9.5		43	-	1.4x2.9	4	6.0	17.63									
.586	106	12.6		58	TC Q	1.4x3.0	1	0.5	3.65	0.6	19							
.583	106	12.4		57	-	1.4x2.9	2	1.5	4.80					90% max dens, opt				
603	105	12.2		55	-	1.4x3.0	3	3.0	7.70									
.595	105	12.2		55	-	1.4x2.9	4	6.0	13.44									
523	110	9.5		49	TC-Q	1.4x3.0	1	0.5	3.49	0.7	27							
.511	111	9.5		50	-	-	2	1.5	7.11					95% max dens, opt-3%				
.522	110	9.5		49	-	-	3	3.0	10.94									
516	111	9.5		49	-	1.4x2.9	4	6.0	18.33									
505	111	12.5		66	TC Q	1.4x3.0	1	0.5	3.32	0.8	18							
.505	111	12.4		65	-	-	2	1.5	5.24					95% max dens, opt				
.500	112	12.3		66	-	-	3	3.0	8.88									
506	111	12.6		67	-	-	4	6.0	13.99									
526	110	9.9	17.6	51	TC R	1.4x3.0	1	1.7	2.79	0.1	15							
515	111	9.9	15.4	52		-	2	5.9	10.82					95% max dens opt-3%				
520	111	9.7	16.7	50		1.4x3.1	3	6.0	10.72									
503	112	9.9	16.2	53		1.4x3.0	4	3.0	5.76									
512	111	12.8	17.6	67	TC-R	1.4x3.0	1	1.4	3.04	0.1	15							
.518	111	12.9	17.0	67			2	3.0	5.66					95% max dens opt				
.537	110	12.9	13.4	65	-		3	6.3	12.30									
520	111	12.7	16.3	66	-	-	4	6.0	10.85									
.440	117	9.9	16.2	60	TC-R	1.4x3.0	1	1.5	3.88	0.2	18							
.435	117	9.9	16.1	61	-	1.4x3.1	2	3.2	6.41					100% max dens opt-3%				
442	117	9.9	16.0	61		1.4x3.0	3	6.0	12.20									
439	117	12.8	16.4		TC-R	1.4x3.1	1	1.6	4.33	0.6	15							
439	117	12.9	15.4			1.4x3.0	2	3.0	5.75					100% max dens opt				
447	116	12.9	17.8			1.4x3.1	3	3.6	11.88									

TC – Triaxial Compression
UC – Unconfined Compression
DS – Direct Shear
UU – Unconsolidated Undrained
CD – Consolidated Drained
CU – Consolidated Undrained
* Values at Pressure T/SQ FT

ENG FORM 2086, 1 MAR 64 (PREVIOUS EDITIONS MAY BE USED) (EM 1110-2-1902) (TRANSLUCENT)

TEST DATA SUMMARY

SWDED-GL Report 11332

FEATURE ______________ Dierks Dam

Sheet 2 of 3

Boring No	Sam. No	Depth or Elev of Sample	Laboratory Classification	Mechanical Analysis: Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits: LL	PL	Specific Gravity G	Nat Water Cont %	Natural Dry Density Lbs/Cu Ft	Compaction Data: Opt Water %	Maximum Dry Density Lbs/Cu Ft
X-15633-34		Cont'd	CL	0	16	84		53	16	2.70				

Shear Data: Initial e	Dry Density Lbs/Cu Ft	w_o %	w_f %	S_o %	Type Test	Specimen Size Inches	Test	σ_m T/Sq Ft	σ_1 T/Sq Ft	c T/Sq Ft	ϕ Degrees
602	105	9.8	15.4	43	DS-3	3 x 3 x 0.5	1			0	31
602	105	9.8	14.8	43		"	2				
598	105	12.6	13.5	56	DS-5	3 x 3 x 0.5	1			0	31
597	105	12.6	14.1	56		"	2				
517	111	9.6	15.4	50	DS-2	3 x 3 x 0.5	1			0	32
517	111	9.7	15.3	50	"		2				
516	111	12.6	15.0	65	DS-1	3 x 3 x 0.5	1			0	30
515	111	12.5	15.0	65		"	2				

Permeability: e	k Ft/Min	Consolidation Data: σ_o T/Sq Ft	σ_c T/Sq Ft	C_c	e_{10}*	Remarks
		Approx. remold conditions				
		90% max dens, opt - 3%				
		90% max dens, opt				
		95% max dens, opt - 3%				
		95% max dens, opt				

ENG FORM 2086 1 MAR 54 (PREVIOUS EDITIONS MAY BE USED) (EM 1110-2-1903) (TRANSLUCENT)

TC – Triaxial Compression UC – Unconfined Compression DS – Direct Shear UU – Unconsolidated Undrained CD – Consolidated Drained CU – Consolidated Undrained *Values at Pressure T/SQ FT

TEST DATA SUMMARY

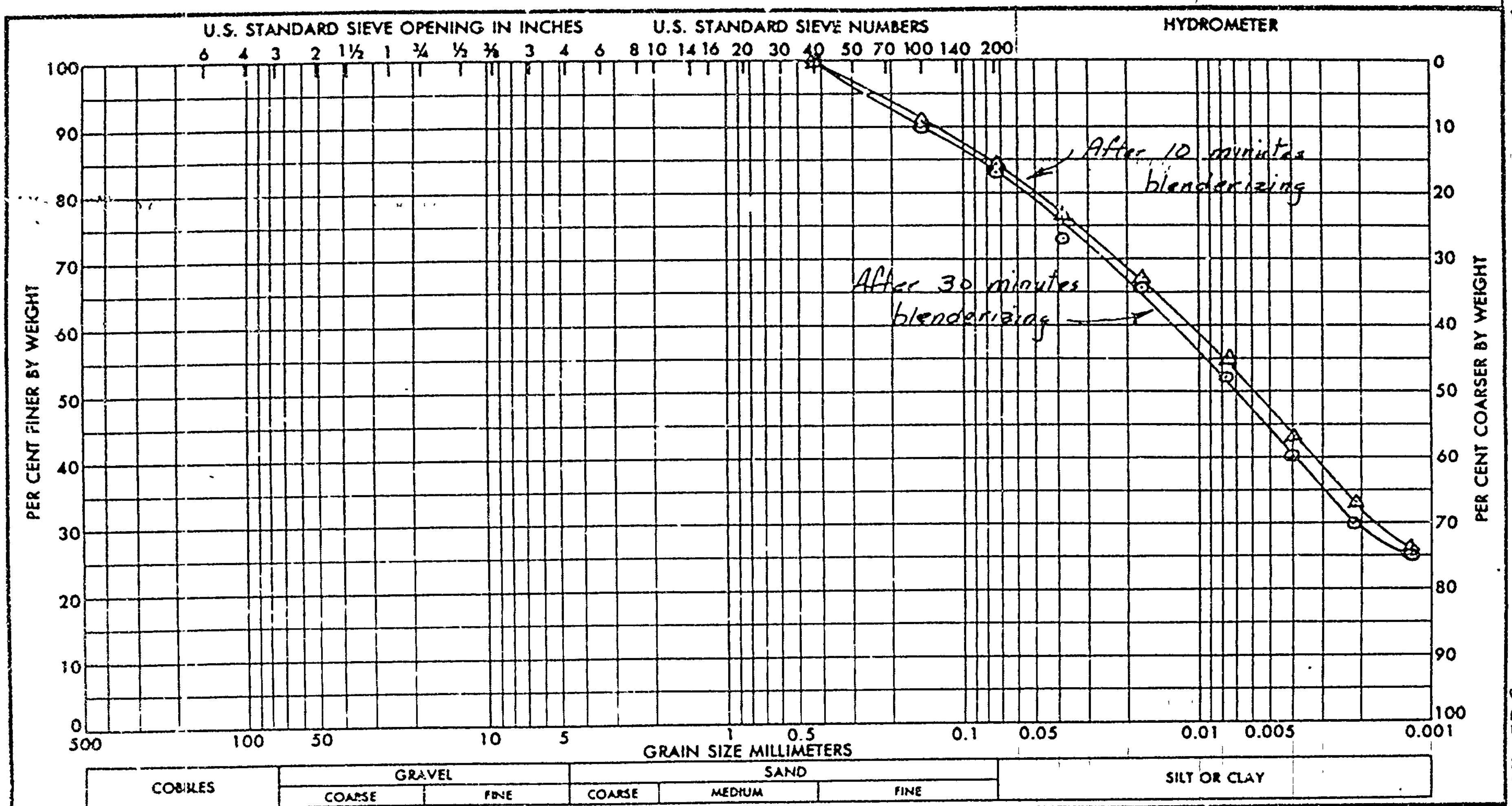
SWDED-GL Report 11332 FEATURE Dierks Dam

Boring No	Sam No	Depth or Elev of Sample	Laboratory Classification	Gravel %	Sand %	Fines %	D_{10}	LL	PL	Specific Gravity G	Nat Water Cont %	Natural Dry Density Lbs/Cu Ft	Opt Water %	Maximum Dry Density Lbs/Cu Ft
X-15011			SC	0	53	47		35	18	2.69(est)			16.0	113.2

Note. Classification and compaction test data from SWDED-GL Report 11227 29 Sep 1976.

Initial e	Dry Density Lbs/Cu Ft	w_o %	w_f %	S_o %	Type Test	Specimen Size Inches	Test	σ_3 T/SQ FT	σ_1 T/SQ FT	c T/SQ FT	ϕ Degrees	Permeability e	k FT/MIN	Consolidation Data
														Approx remold conditions
545	107	13.8	20.2	65	TC-R	1.4x3.0	1	1.7	3.62	0.1	16			
567	107	13.9	18.8	66	-	-	2	3.0	5.32					95% max dens, opt-3%
.565	107	13.8	17.3	66	-	-	3	6.0	11.10					
578	106	16.7	20.6	78	TC-R	1.4x3.0	1	1.4	2.72	0.1	15			
.560	108	16.7	18.7	80	-	-	2	3.1	5.62					95% max dens, opt
.559	108	16.8	17.4	81	-	-	3	5.8	10.29					
481	113	13.5	18.7	75	TC-R	1.4x3.0	1	1.5	3.81	0.4	15			
480	112	13.8	18.0	78	-	1.4x3.1	2	3.2	6.87					100% max dens, opt-3%
.494	112	13.9	17.0	75		1.4x3.0	3	6.0	11.84					
486	113	16.5	18.1	91	TC-R	1.4x3.0	1	1.5	4.28	0.6	15			
.498	112	16.6	17.9	89	-	-	2	3.0	6.83					100% max dens, opt
486	113	16.6	16.7	92	-	-	3	6.0	12.00					

TC – Triaxial Compression, UC – Unconfined Compression, DS – Direct Shear, Uu – Unconsolidated Undrained, CD – Consolidated Drained, CU – Consolidated Undrained, *Values at Pressure T/SQ FT



SAMPLE NO.	ELEV OR DEPTH	CLASSIFICATION	NAT W%	LL	PL	PI
X-15623-24		Crushed SHALE-SANDSTONE				
		Not blenderized		25	15	10
		10' blenderized		33	16	17
		30' blenderized		35	—	—

PROJECT Dierks Dam

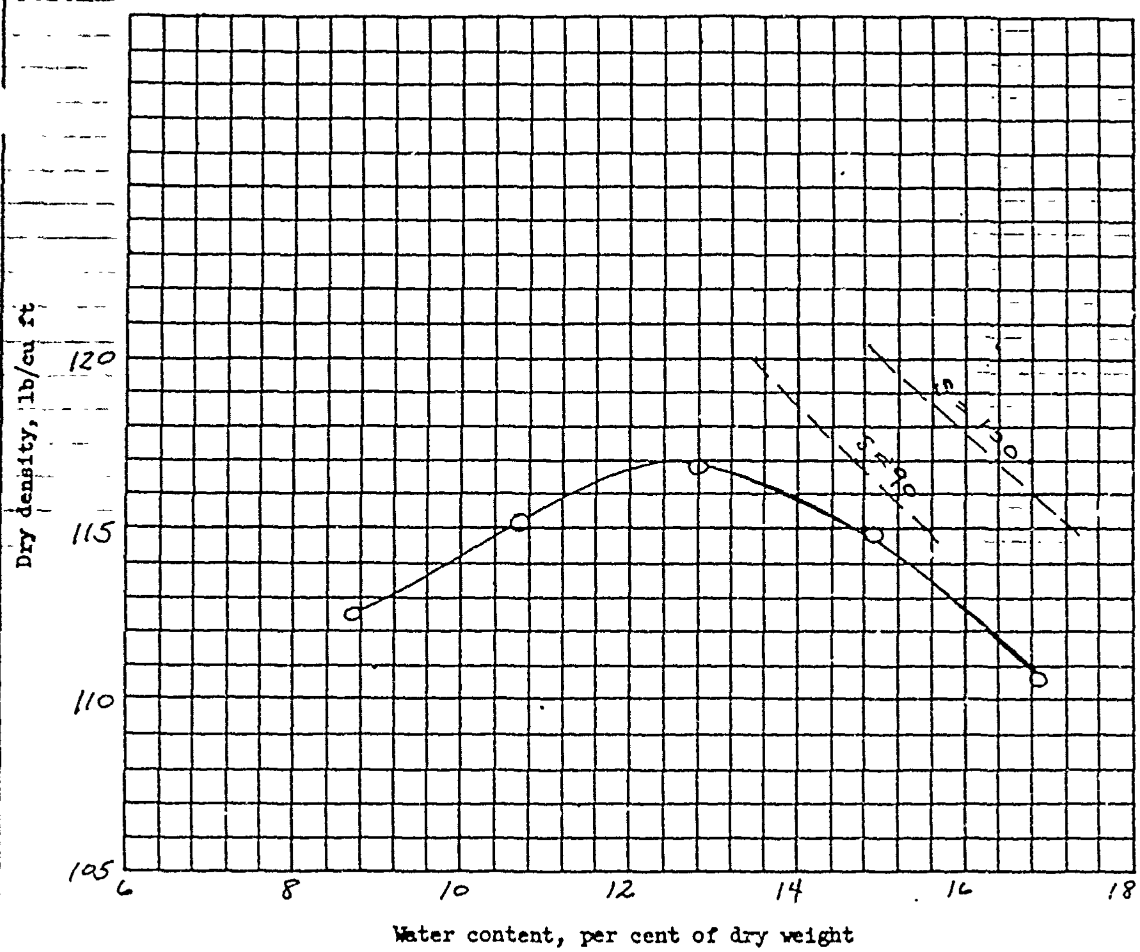
AREA

BORING NO

DATE July 72

GRADATION CURVES

ENG FORM 1 MAY 63 2087 REPLACES WES FORM NO 1241, SEP 1962, WHICH IS OBSOLETE



Standard compaction test

25 blows per each of 3 layers, with 5.5 lb rammer and

12 inch drop. 4 inch diameter mold

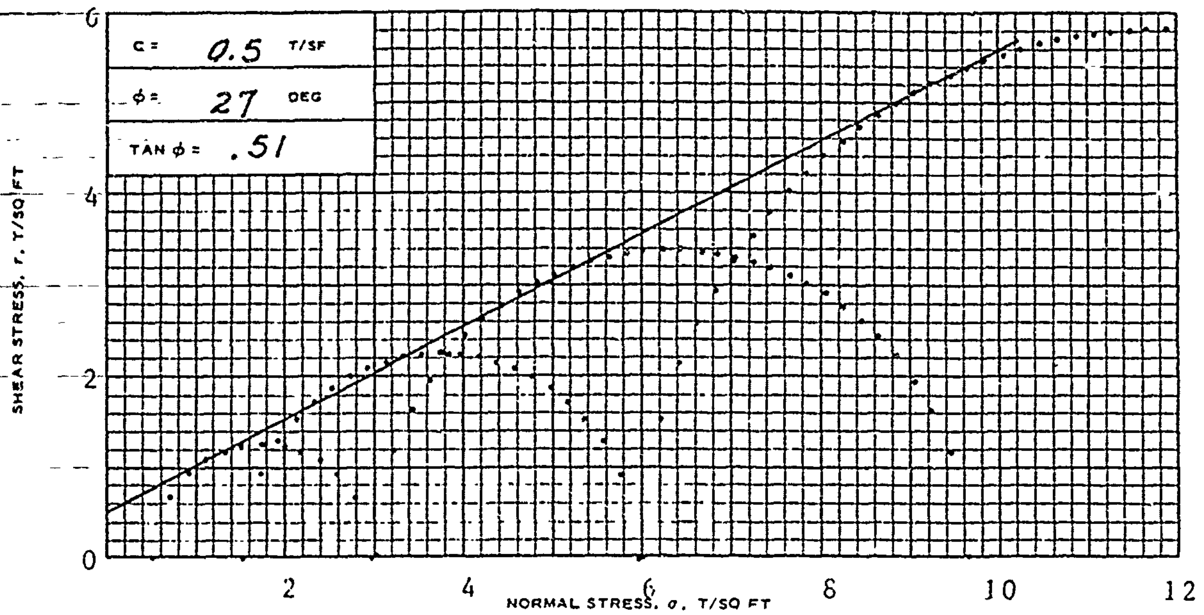
Sample No.	Elev or Depth	Classification	G	LL	PL	% > No. 4	% > 3/4 in.
X-15623-		Shale material (CL)	2.70	33	16		
16624							

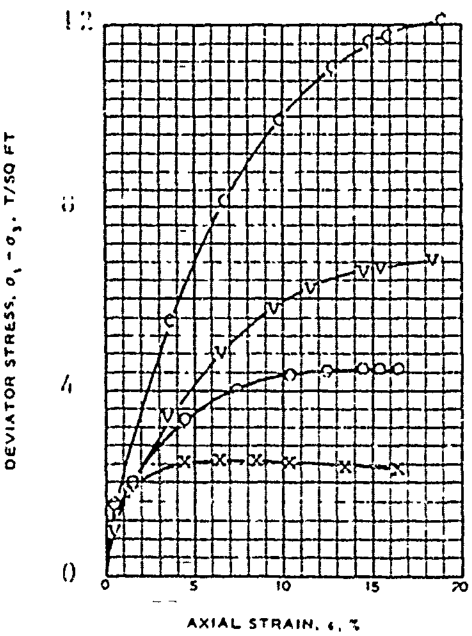
Sample No.	X-15623-24			
Natural water content in per cent				
Optimum water content in per cent	12.6			
Max dry density in lb/cu ft	117.0			

Remarks	Project Dierks Dam
	Area
	Boring No. / Date May 72
	COMPACTION TEST REPORT

ENG FORM 1 MAY 63 2091 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) G 3425

Plate 2





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	9.6	9.5	9.5	9.5
	DRY DENSITY LB/CU FT	γd_o	105	104	106	105
	SATURATION, %	S_o	43	42	43	43
	VOID RATIO	e_o	.601	.609	.586	.595
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	U_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.48	4.46	6.64	11.63
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	12	22	24	30
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.3	1.3	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to 90% max density at optimum water content - 3%.

LL 33	PL 16	PI 17	G: 2.70	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

BORING NO

SAMPLE NO X-15623-24

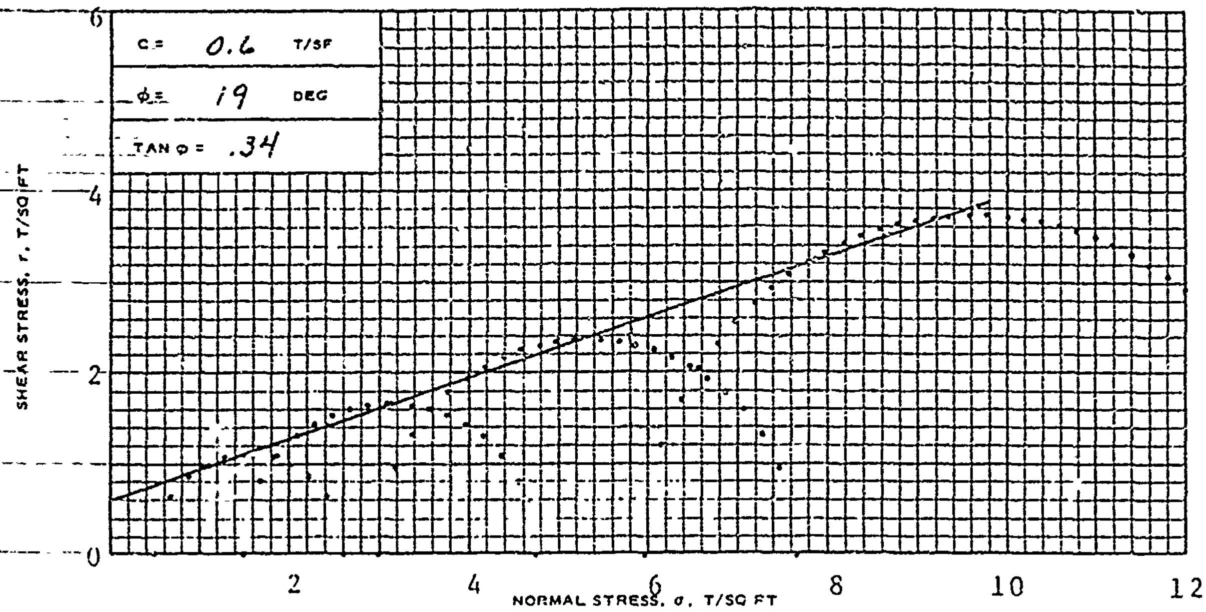
DEPTH/ELEV

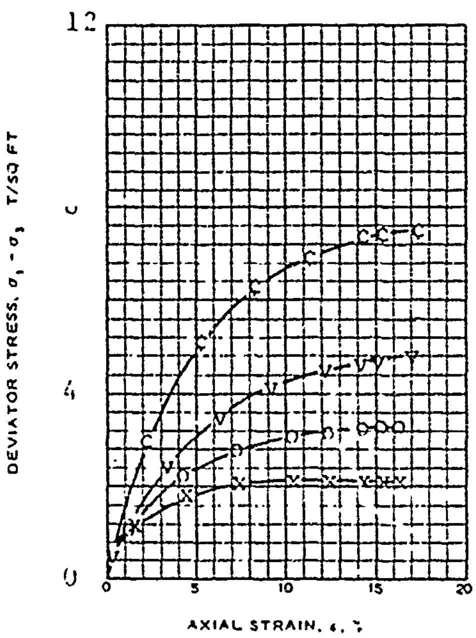
LABORATORY SWD

DATE May 72.

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089
REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





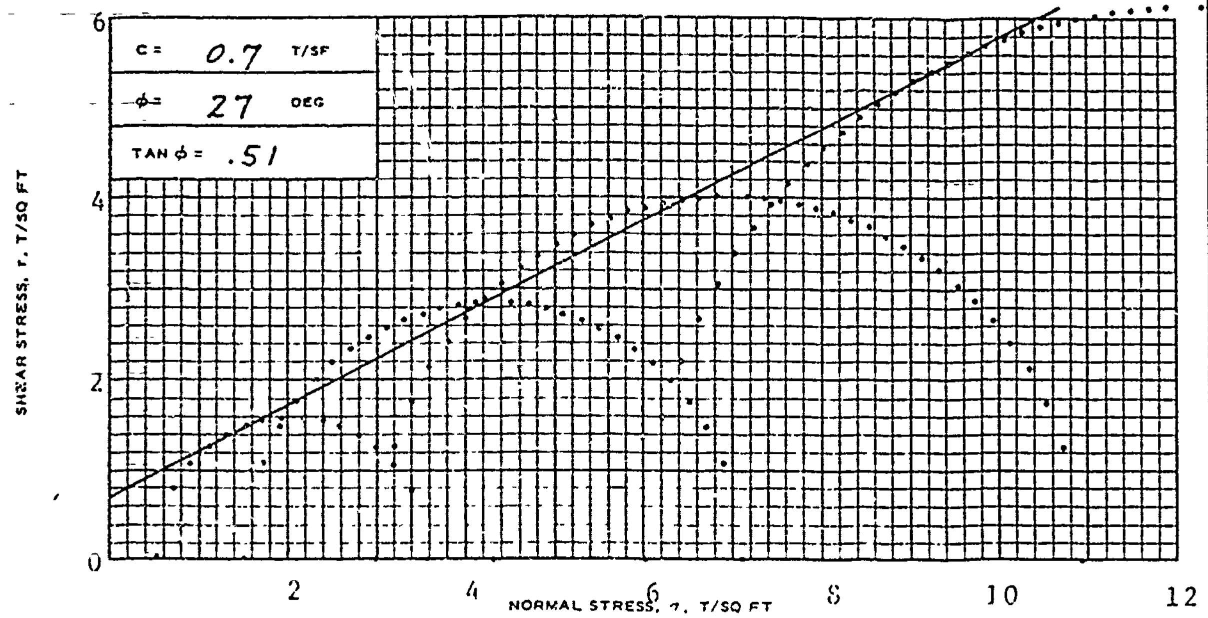
SPECIMEN NO		—	1	2	3	4
INITIAL	WATER CONTENT, %	w_o	12.6	12.4	12.4	12.2
	DRY DENSITY LB/CU FT	γd_o	106	106	105	105
	SATURATION, %	S_o	58	57	55	55
	VOID RATIO	e_o	.586	.583	.602	.595
BEFORE SHEAR	WATER CONTENT, %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION, %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.15	3.30	4.70	7.44
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	23	22	23	23
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.3	1.3	1.4	1.3
INITIAL HEIGHT, IN.		H_o	3.0	2.9	3.0	2.9

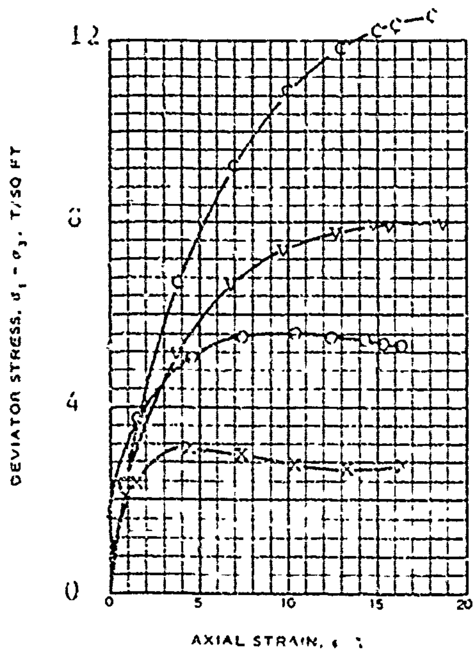
CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approximately 90% max density at optimum water content.

LL 33	PL 16	PI 17	Gs 2.70	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

REMARKS:	PROJECT Dierks Dam
	BORING NO — SAMPLE NO X-15623-24
	DEPTH/ELEV
	LABORATORY SWD — DATE May 72
	TRIAXIAL COMPRESSION TEST REPORT





SPECIMEN NO.			1	2	3	4
INITIAL	WATER CONTENT %	w_o	9.5	9.5	9.5	9.5
	DRY DENSITY LB/CU FT	γd_o	110	111	110	111
	SATURATION, %	S_o	49	50	49	49
	VOID RATIO	e_o	.523	.511	.522	.516
BEFORE SHEAR	WATER CONTENT %	w_c				
	DRY DENSITY LB/CU FT	γd_c				
	SATURATION %	S_c				
	VOID RATIO	e_c				
	FINAL BACK PRESSURE, T/SQ FT	u_o				
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	.5	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	3.09	5.61	7.94	12.23
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	7	16	23	23
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN		D_o	1.4	1.4	1.4	1.3
INITIAL HEIGHT, IN		H_o	3.0	3.0	3.0	2.9

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approximately 95% max density at optimum - 3%.

LL 33	PL 16	PI 17	G 2.70	TYPE OF SPECIMEN Remolded	TYPE OF TEST Q

REMARKS:

PROJECT Dierks Dam

BORING NO

SAMPLE NO X-15623-24

DEPTH/ELEV

LABORATORY SWD

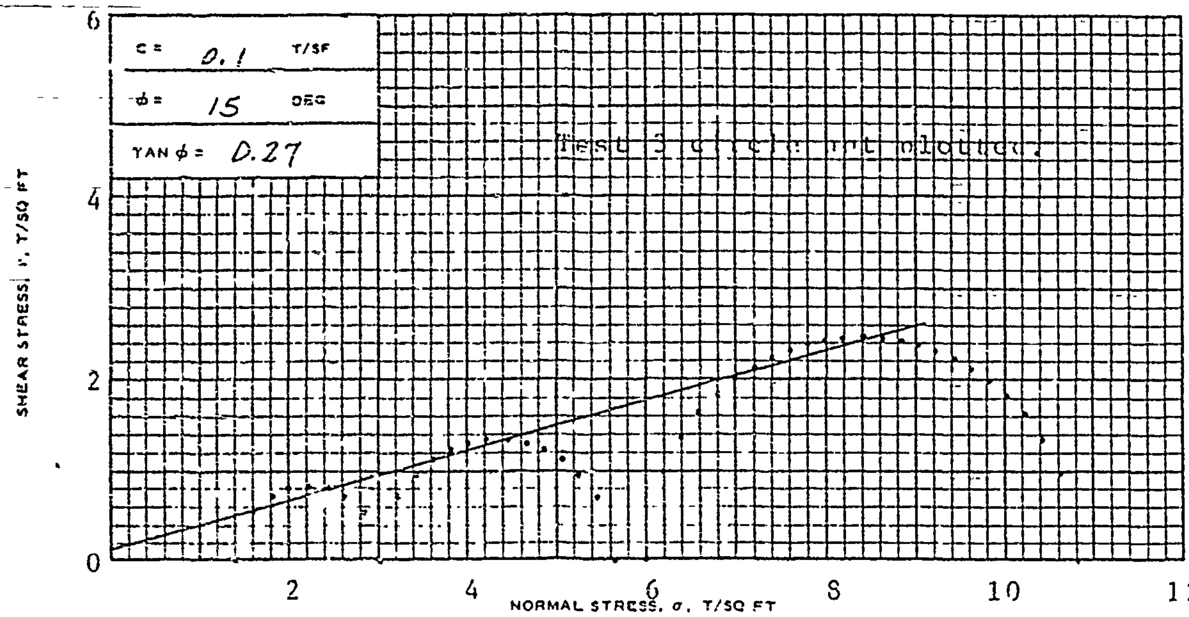
DATE May 72

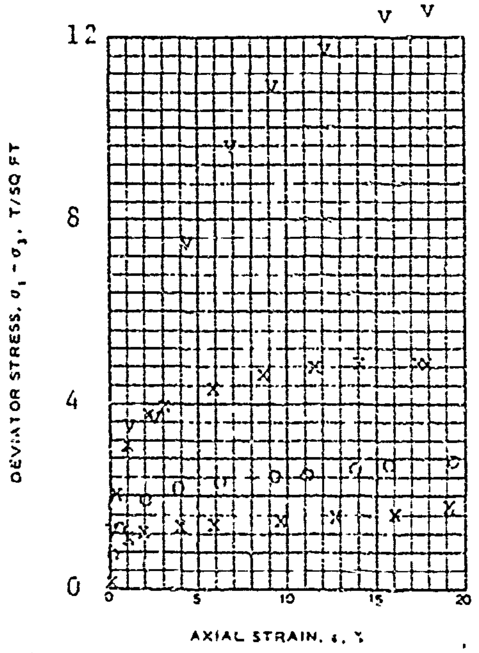
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate 5

Plates 6 & 7 Not available





SPECIMEN NO			1	2	3	4
INITIAL	WATER CONTENT, %	w_o	12.6	12.9	12.9	12.7
	DRY DENSITY LB/CU FT	γ_{d_o}	111	111	110	111
	SATURATION, %	S_o	67	67	65	66
	VOID RATIO	e_o	.512	.518	.537	.520
BEFORE SHEAR	WATER CONTENT, %	w_c	17.6	17.0	13.4	16.3
	DRY DENSITY LB/CU FT	γ_{d_c}	114	115	124	117
	SATURATION, %	S_c	100	100	100	100
	VOID RATIO	e_c	.476	.459	.361	.439
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.4	12.0	14.4	12.3
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.4	3.0	6.3	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.64	2.66	6.00	4.85
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	270	300	240	300
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	1.4
INITIAL HEIGHT, IN		H_o	3.0	3.0	3.0	3.0

CONTROLLED- Strain TEST

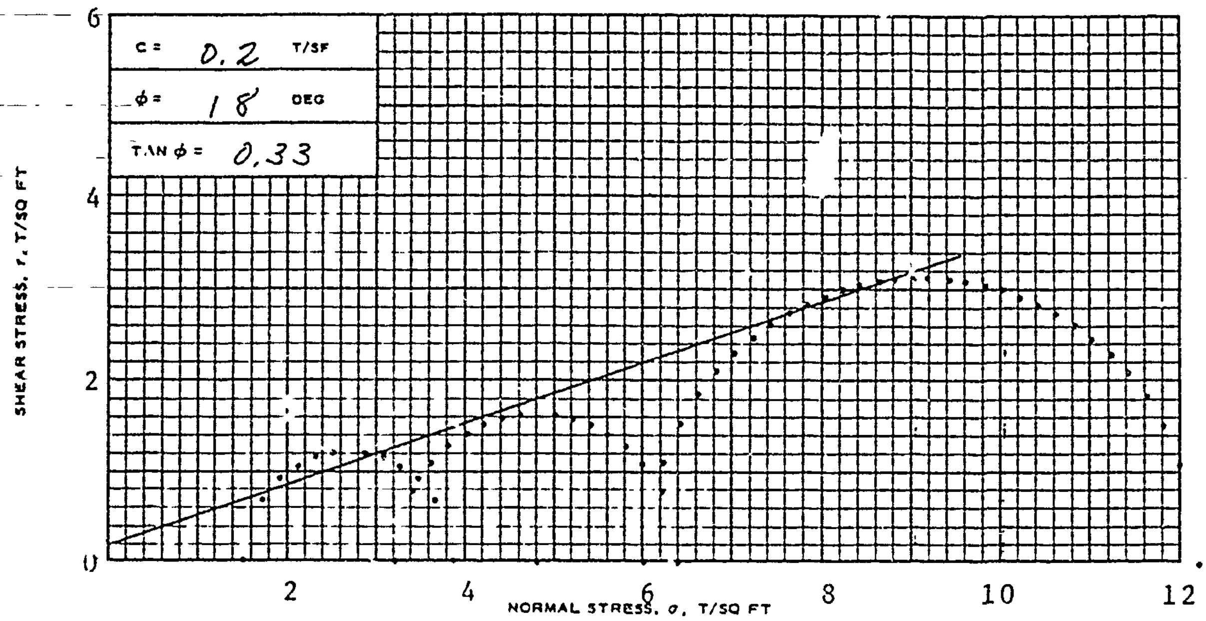
DESCRIPTION OF SPECIMENS Remolded to approx 95% max density at optimum.

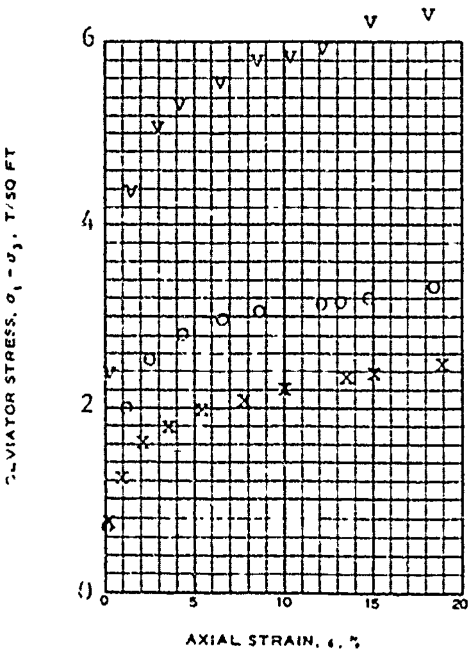
LL 33	PL 16	PI 17	G 2.70	TYPE OF SPECIMEN	TYPE OF TEST R

REMARKS	PROJECT Dierks Dam	
	BORING NO	SAMPLE NO X-15623-24
	DEPTH/ELEV	
	LABORATORY SWD	DATE May 72

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





SPECIMEN NO.		—	1	2	3
INITIAL	WATER CONTENT, %	w_o	9.9	9.9	9.9
	DRY DENSITY LB/CU FT	γd_o	117	117	117
	SATURATION, %	S_o	60	61	61
	VOID RATIO	e_o	.440	.435	.442
BEFORE SHEAR	WATER CONTENT, %	w_c	16.2	16.1	16.0
	DRY DENSITY LB/CU FT	γd_c	117	117	118
	SATURATION, %	S_c	100	100	100
	VOID RATIO	e_c	.438	.435	.431
	FINAL BACK PRESSURE, T/SQ FT	u_o	8.8	14.6	18.2
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.5	3.2	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.38	3.21	6.20
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	340	340	280
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$			
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.1	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approx max density at optimum − 3%.

LL 33	PL 16	PI 17	G 2.70	TYPE OF SPECIMEN Remolded	TYPE OF TEST R

REMARKS:

PROJECT Dierks Dam

BORING NO

SAMPLE NO. X-15623-24

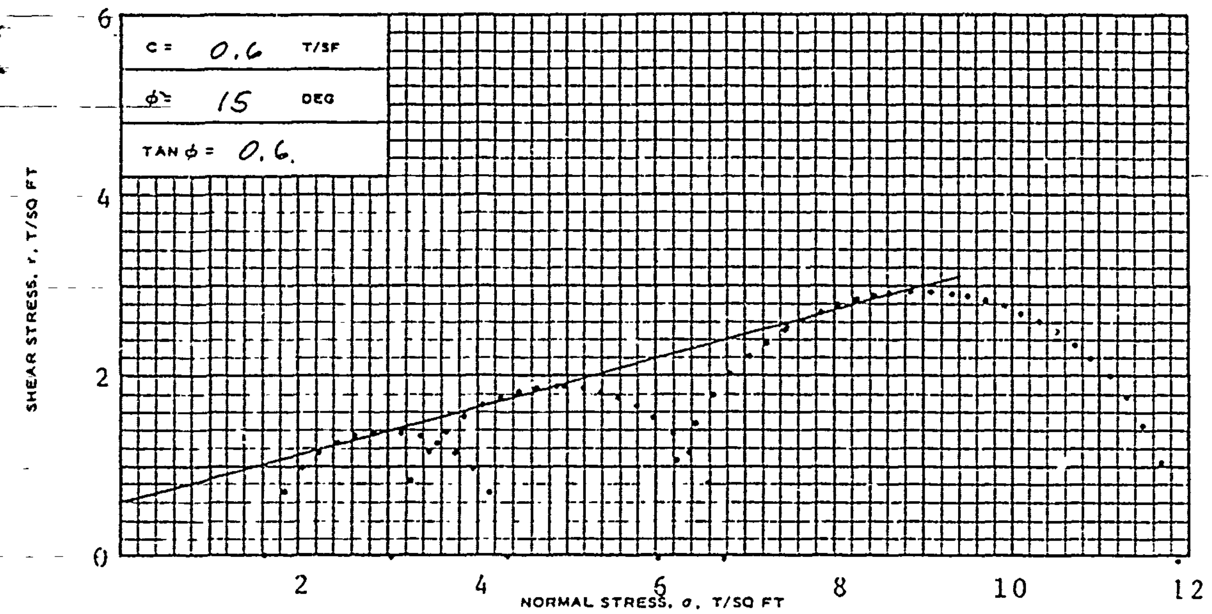
DEPTH/ELEV

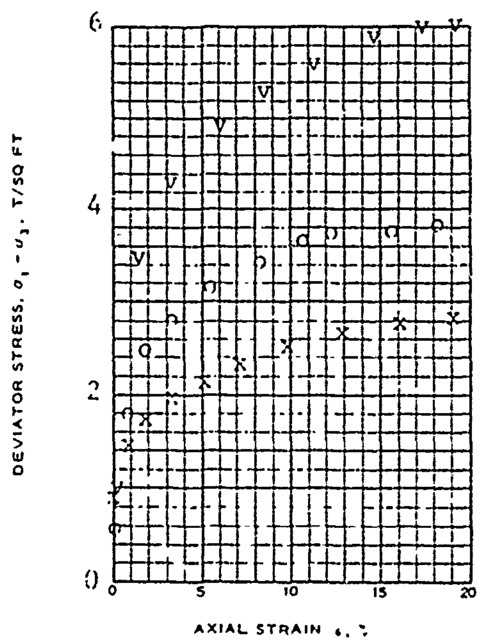
LABORATORY SWD

DATE May 72

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT





SPECIMEN NO.		—	1	2	3
INITIAL	WATER CONTENT, %	w_o	12.8	13.0	12.9
	DRY DENSITY LB/CU FT	γd_o	117	117	116
	SATURATION, %	S_o	79	80	78
	VOID RATIO	e_o	.439	.439	.447
BEFORE SHEAR	WATER CONTENT, %	w_c	16.4	15.4	14.8
	DRY DENSITY LB/CU FT	γd_c	117	119	121
	SATURATION, %	S_c	100	100	100
	VOID RATIO	e_c	.441	.415	.398
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.8	7.2	8.7
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.6	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{max}$	2.73	3.75	5.88
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	270	200	270
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$			
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	3.1	3.0	3.1

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approx max density at optimum.

LL 33	PL 16	PI 17	G 2.70	TYPE OF SPECIMEN Remolded	TYPE OF TEST R

REMARKS:

PROJECT Dierks Dam

BORING NO

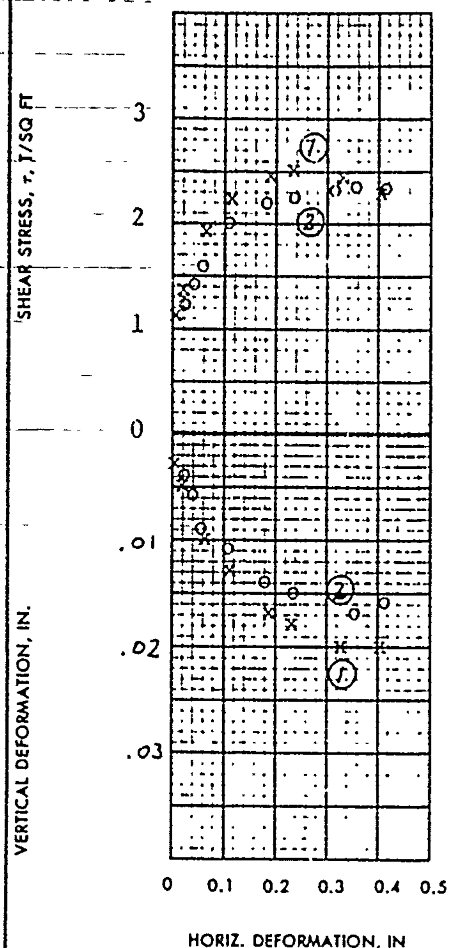
SAMPLE NO X-15623-24

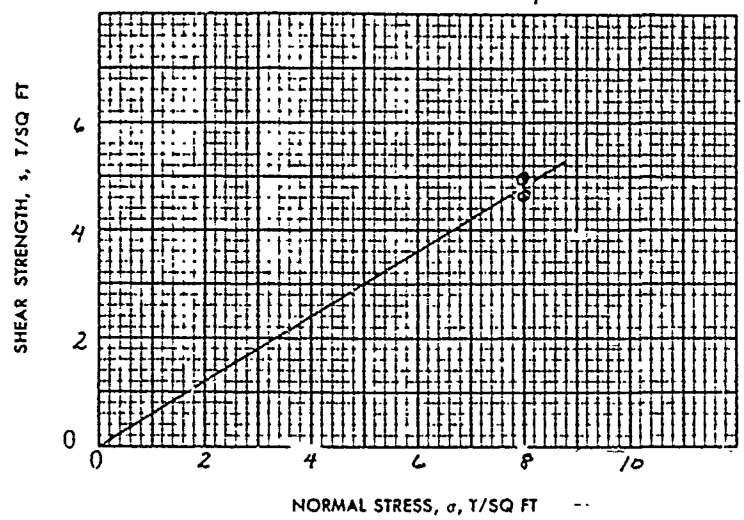
DEPTH/ELEV

LABORATORY SWD

DATE May 72

TRIAXIAL COMPRESSION TEST REPORT





SHEAR STRENGTH PARAMETERS

ϕ' = 31°

TAN ϕ' = .60

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	9.8 %	9.8 %	%	%
	VOID RATIO	e_o	.602	.602		
	SATURATION	S_o	43 %	43 %	%	%
	DRY DENSITY, LB/CU FT	γ_d	105	105		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	15.4 %	14.[illegible] %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	8.0	8.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	4.96	4.63		
ACTUAL TIME TO FAILURE, MIN		t_f	3250	5900		
RATE OF STRAIN, IN /MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN	Remolded to approx 90% max dens at optimum - 3%.	3.0 IN. SQUARE	.5 IN. THICK	
CLASSIFICATION	CL			
LL 33	PL 16	PI 17		G_s 2.70

REMARKS

PROJECT Dierks Dam

AREA

BORING NO.

SAMPLE NO. X-15623-24

DEPTH EL

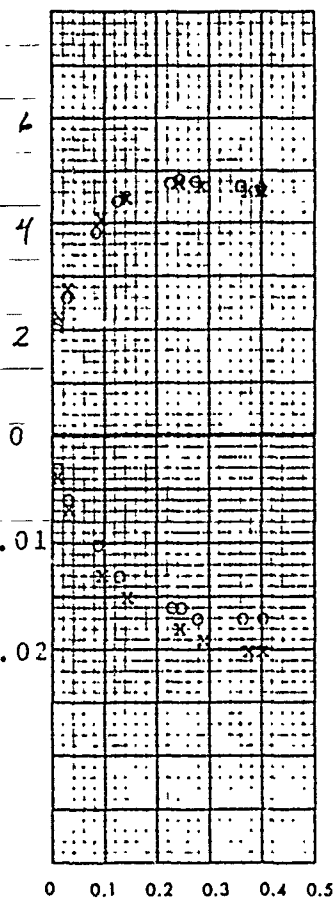
DATE May 72

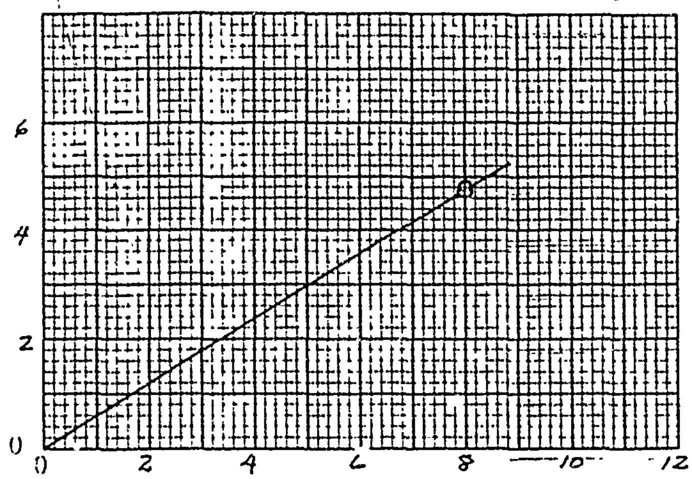
DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 63 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO : 1964 OF—214-945

PLATE IX-3





SHEAR STRENGTH PARAMETERS

ϕ' = 31

TAN ϕ' = 0.60

c' = 0.0 T/SQ FT

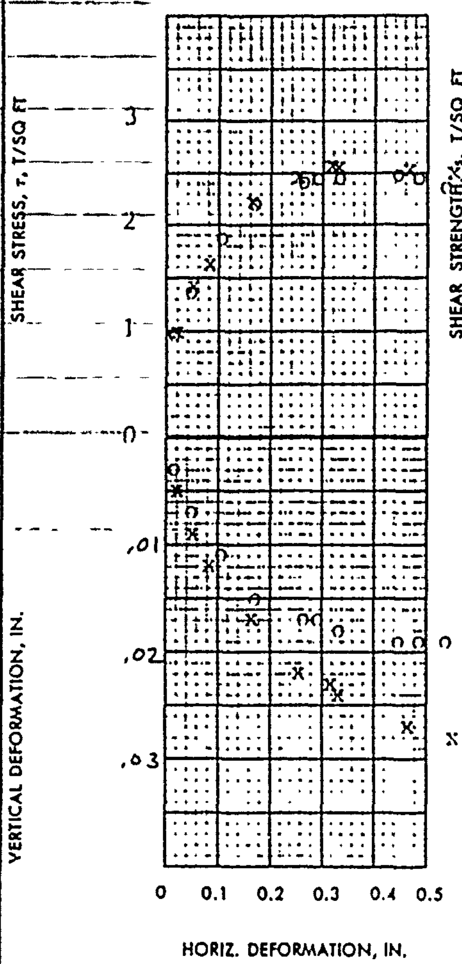
☐ CONTROLLED STRESS

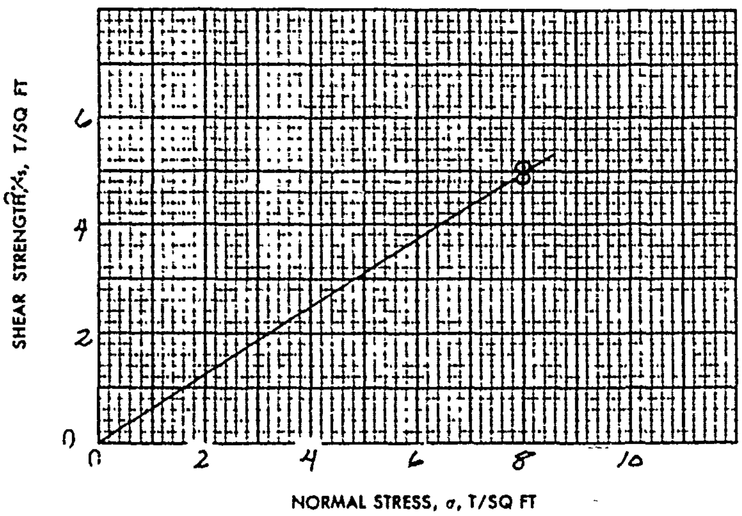
☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	12.6 %	12.6 %	%	%
	VOID RATIO	e_o	.598	.597		
	SATURATION	S_o	56 %	56 %	%	%
	DRY DENSITY, LB/CU FT	γ_d	105	105		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	13.5 %	14.1 %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	8.0	8.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	4.72	4.60		
ACTUAL TIME TO FAILURE, MIN		t_f	2900	2800		
RATE OF STRAIN, IN./MIN						
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN	3.0 IN. SQUARE	.5 IN. THICK	
CLASSIFICATION	Remolded to approx 90% max density at optimum water. CL		
LL 33	PL 16	PI 17	G_s 2.70

REMARKS	PROJECT Dierks Dam	
	AREA	
	BORING NO.	SAMPLE NO. X-15623-24
	DEPTH EL	DATE May 72
	DIRECT SHEAR TEST REPORT	





SHEAR STRENGTH PARAMETERS

φ' = 32

TAN φ' = .62

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

X ☒ CONTROLLED STRAIN

TEST NO.			1	2	3	
INITIAL	WATER CONTENT	w_o	9.6 %	9.7 %	%	%
	VOID RATIO	e_o	.517	.517		
	SATURATION	S_o	50 %	50 %	%	%
	DRY DENSITY, LB/CU FT	γ_d	111	111		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	15.4 %	15.3 %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	8.0	8.0		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	5.07	4.56		
ACTUAL TIME TO FAILURE, MIN		t_f	5900	2900		
RATE OF STRAIN, IN./MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN	Remolded to approx 95% maximum density at optimum - 3%.	3.0 IN. SQUARE	.5 IN. THICK
CLASSIFICATION	CL		

LL 33	PL 16	PI 17		G_s 2.70

REMARKS

PROJECT Dierks Dam

AREA

BORING NO.

SAMPLE NO. X-15623-24

DEPTH

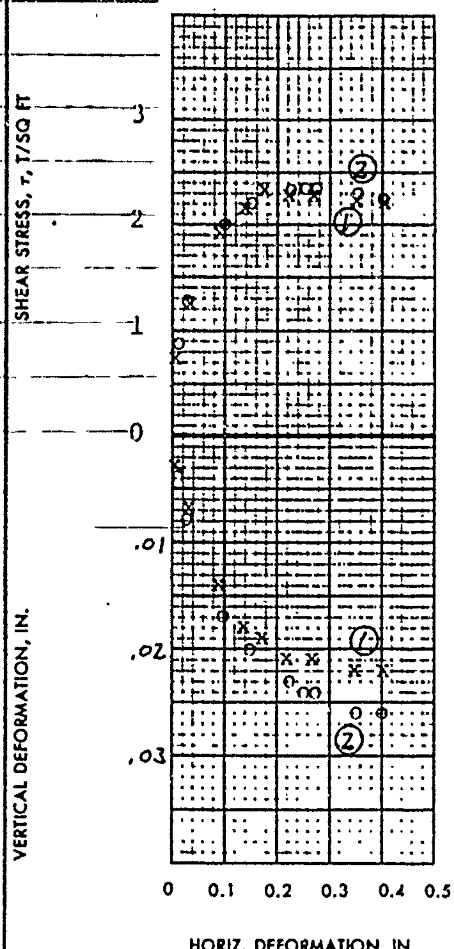
EL

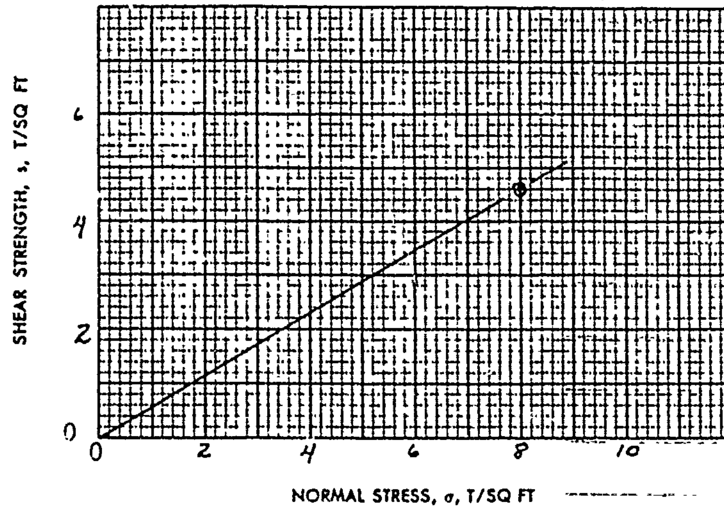
DATE May 72

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO : 1966 OF—214-945





SHEAR STRENGTH PARAMETERS

ϕ' = 30°

TAN ϕ' = .58

c' = 0 T/SQ FT

☐ CONTROLLED STRESS

☐ CONTROLLED STRAIN

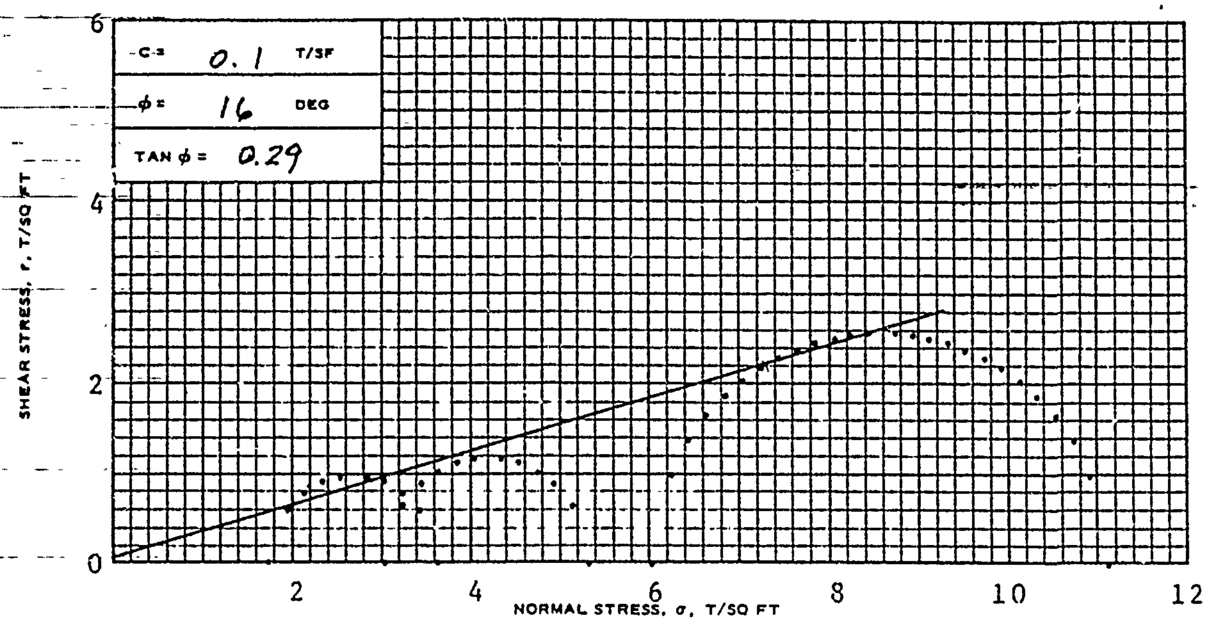
	TEST NO.		1	2	3	
INITIAL	WATER CONTENT	w_o	12.6 %	[illegible] %	%	%
	VOID RATIO	e_o	.51[illegible]	.5[illegible]		
	SATURATION	S_o	65 %	%	%	%
	DRY DENSITY, LB/CU FT	γ_d	111	[illegible]		
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	15.[illegible] %	[illegible] %	%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	[illegible]	[illegible]		
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	[illegible]	[illegible]		
ACTUAL TIME TO FAILURE, MIN		t_f	2[illegible]			
RATE OF STRAIN, IN./MIN			.0001	.0001		
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

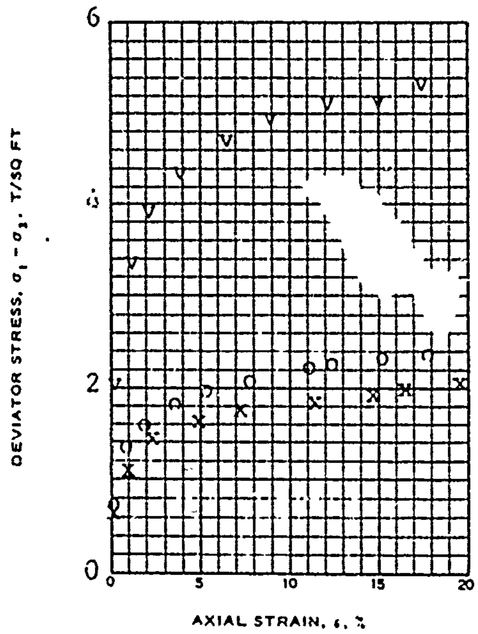
TYPE OF SPECIMEN	Remolded to approx 95% max dens at optimum water content.	3.	IN. SQUARE	.5	IN. THICK
CLASSIFICATION	CL				
LL 33	PL 16	PI 17		G. 2.70	

REMARKS

PROJECT	Dierks Dam
AREA	
BORING NO.	SAMPLE NO. X-15623-24
DEPTH EL	DATE May 72

DIRECT SHEAR TEST REPORT





SPECIMEN NO.		—	1	2	3	
INITIAL	WATER CONTENT, %	w_o	13.8	13.9	13.8	
INITIAL	DRY DENSITY LB/CU FT	γd_o	107	107	107	
INITIAL	SATURATION, %	S_o	65	66	66	
INITIAL	VOID RATIO	e_o	.565	.567	.565	
BEFORE SHEAR	WATER CONTENT, %	w_c	20.2	18.8	17.3	
BEFORE SHEAR	DRY DENSITY LB/CU FT	γd_c	109	112	115	
BEFORE SHEAR	SATURATION, %	S_c	100	100	100	
BEFORE SHEAR	VOID RATIO	e_c	.543	.506	.465	
BEFORE SHEAR	FINAL BACK PRESSURE, T/SQ FT	u_o	12.6	14.6	16.9	
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.7	3.0	6.0	
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	1.92	2.32	5.10	
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	280	230	280	
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$				
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4	
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0	

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approx 95% max density at optimum - 3%.

LL 35	PL 18	PI 17	G 2.69	TYPE OF SPECIMEN Remolded	TYPE OF TEST R

REMARKS:

PROJECT Dierks Dam

BORING NO. Quarry | SAMPLE NO. X-15011

DEPTH/ELEV

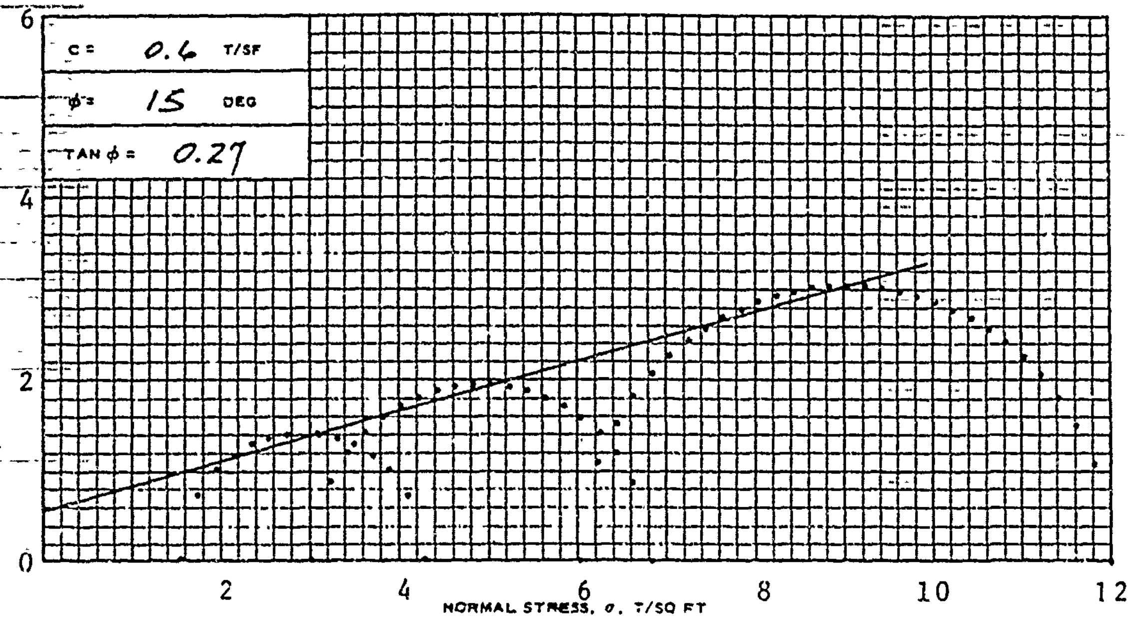
LABORATORY SWD | DATE May 72

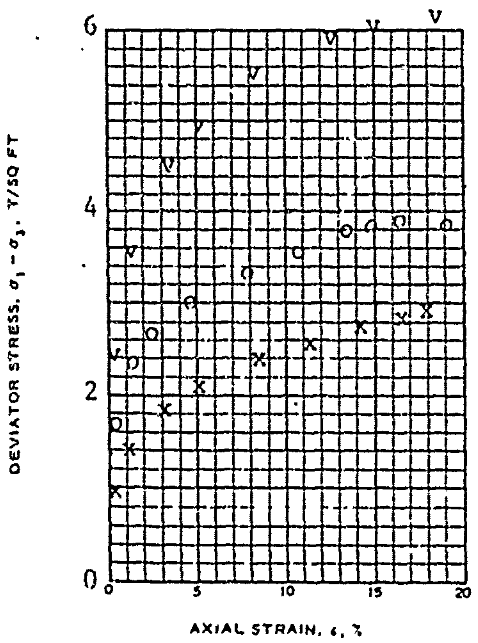
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

Plate 15

Plates 16 + 17 not available





SPECIMEN NO.		–	1	2	3
INITIAL	WATER CONTENT, %	w_o	16.5	16.6	16.6
	DRY DENSITY LB/CU FT	γd_o	113	112	113
	SATURATION, %	S_o	91	89	92
	VOID RATIO	e_o	.486	.498	.486
BEFORE SHEAR	WATER CONTENT, %	w_c	18.1	17.9	16.7
	DRY DENSITY LB/CU FT	γd_c	113	113	116
	SATURATION, %	S_c	100	100	100
	VOID RATIO	e_c	.487	.481	.449
	FINAL BACK PRESSURE, T/SQ FT	u_o	7.2	5.2	8.2
MINOR PRINCIPAL STRESS, T/SQ FT		σ_3	1.5	3.0	6.0
MAXIMUM DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{MAX}$	2.78	3.83	6.00
TIME TO $(\sigma_1 - \sigma_3)_{MAX}$, MIN		t_f	320	310	280
ULTIMATE DEVIATOR STRESS, T/SQ FT		$(\sigma_1 - \sigma_3)_{ULT}$			
INITIAL DIAMETER, IN.		D_o	1.4	1.4	1.4
INITIAL HEIGHT, IN.		H_o	3.0	3.0	3.0

CONTROLLED- Strain TEST

DESCRIPTION OF SPECIMENS Remolded to approx max density at optimum.

LL 35	PL 18	PI 17	G 2.69	TYPE OF SPECIMEN Remolded	TYPE OF TEST R

REMARKS:

PROJECT Dierks Dam

BORING NO. Quarry | SAMPLE NO. X-15011

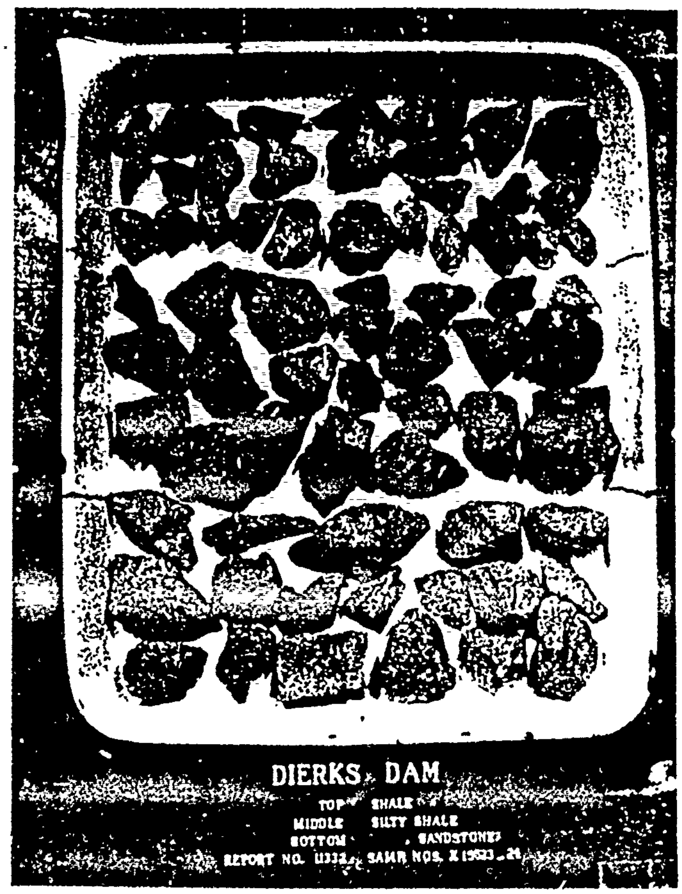
DEPTH/ELEV

LABORATORY SWD | DATE May 72

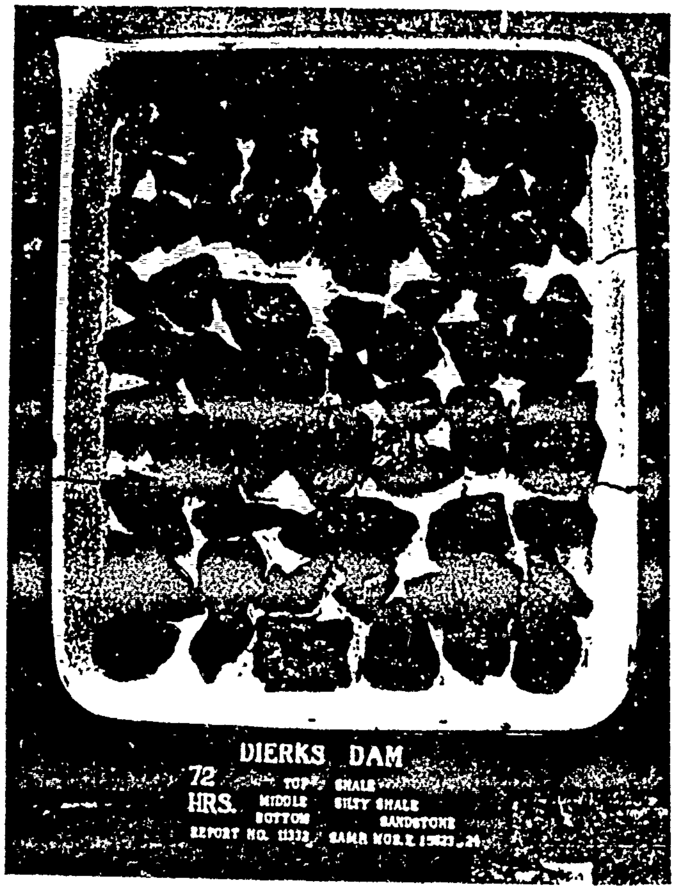
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM NO. 2089 REV JUNE 1970 PREVIOUS EDITION IS OBSOLETE TRANSLUCENT

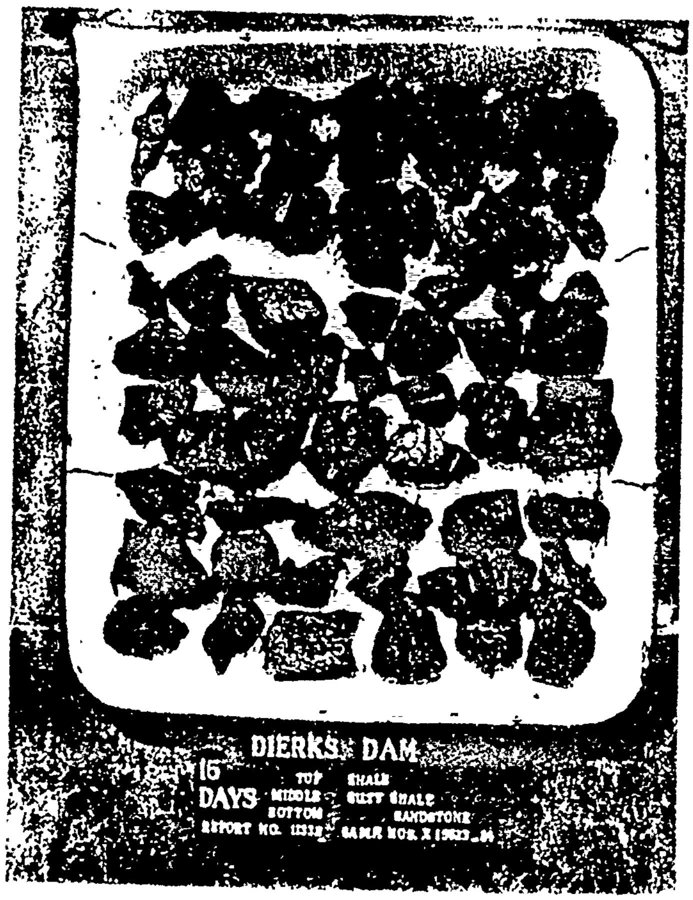
Plate 18



Accelerated Expansion Tests

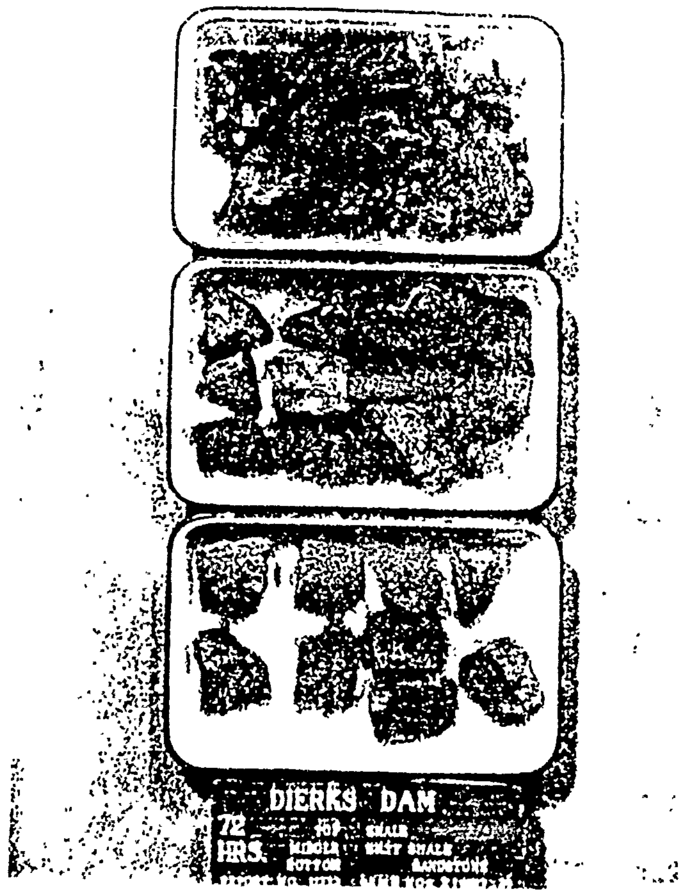


Accelerated Expansion Tests



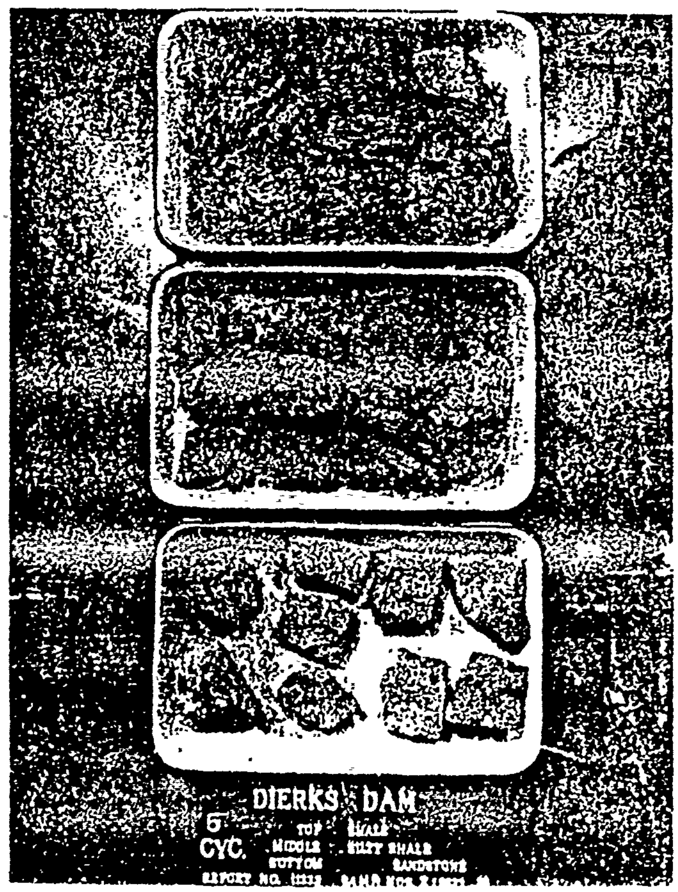
Accelerated Expansion Tests

Slaking Tests



Slaking Tests

Slaking Tests

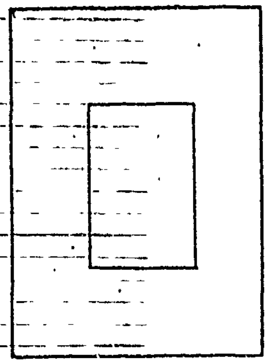


Slaking Tests

APPENDIX D

FOUNDATION MATERIALS

SECTION 1. UNCONFINED COMPRESSION TESTS

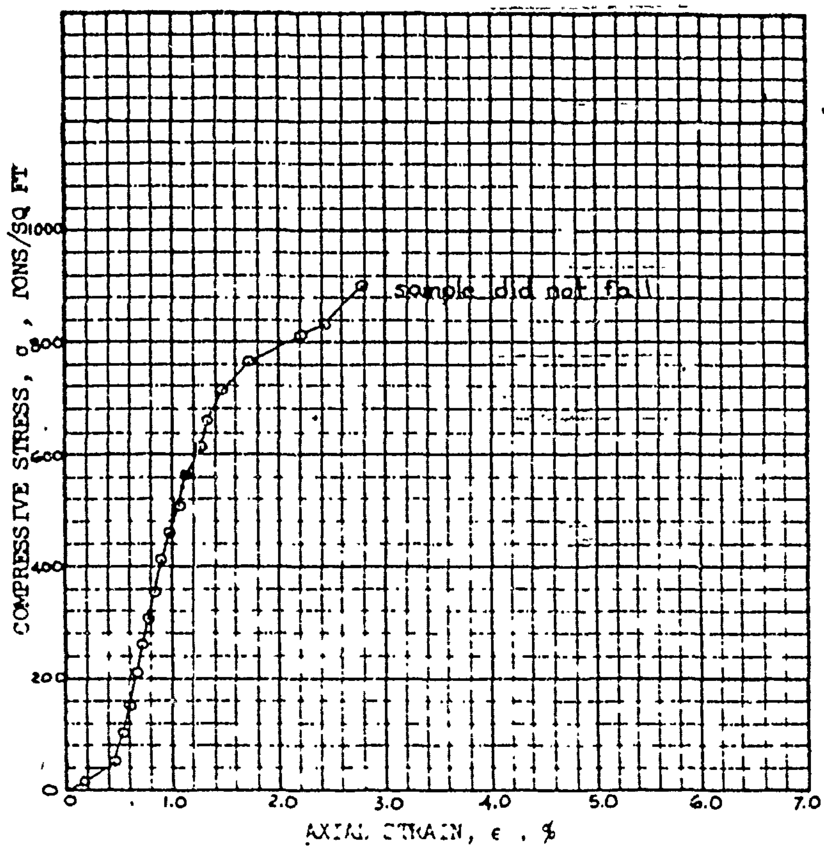


Sketch of specimen
~~after failure~~

TEST TYPE
(Check one)

☑ Controlled-stress
13,000 lbs/min.

☐ Controlled-strain



Type of specimen		☑ Undisturbed ☐ Remolded	Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	— %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	160			
Time to failure, min		t_f	27			
Unconfined compressive strength, tons/sq ft		q_u	819+			
Undrained shear strength, tons/sq ft		s_u	410			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 6.0 ~~cm~~ in. Specimen Height 8.8 ~~cm~~ in.

Remarks

Project Dierks Dam

Area Foundation Material

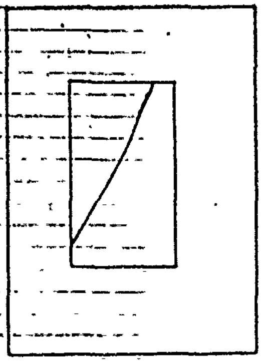
Boring No. GS-37 Sample No. M-3919

Depth, ~~ft~~ 25.6-26.5 Date OCT 64

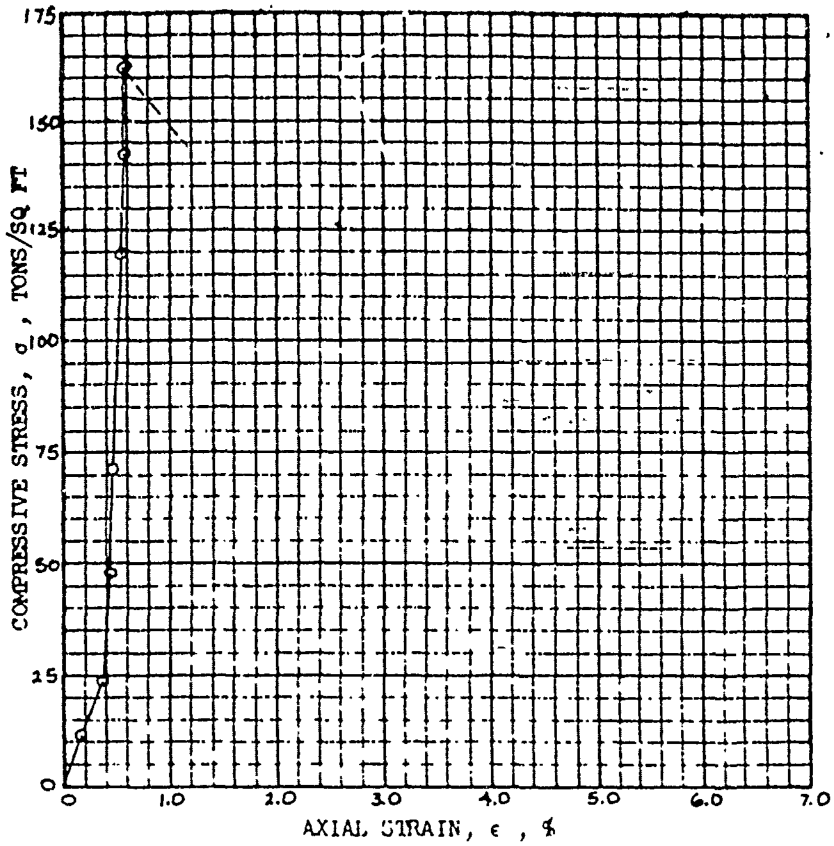
UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 3659 (TRANSLUCENT)

PLATE NO. 7
C 8927



Sketch of specimen after failure



TEST TYPE
(Check one)

[x] Controlled-stress
8,600 lbs/min.

[ ] Controlled-strain

Type of specimen [x] Undisturbed [ ] Remolded			Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	1.5 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	158			
Time to failure, min		t_f	8			
Unconfined compressive strength, tons/sq ft		q_u	158			
Undrained shear strength, tons/sq ft		s_u	79			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 6.2 in. | Specimen Height 10.3 in.

Remarks

Project Ozarks Dam

~~Area~~ Foundation Material

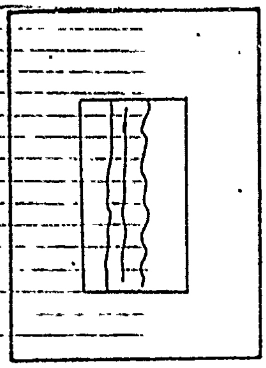
Boring No. GC-37 Sample No. M-3918

Depth, ft 181-190 Date OCT 64

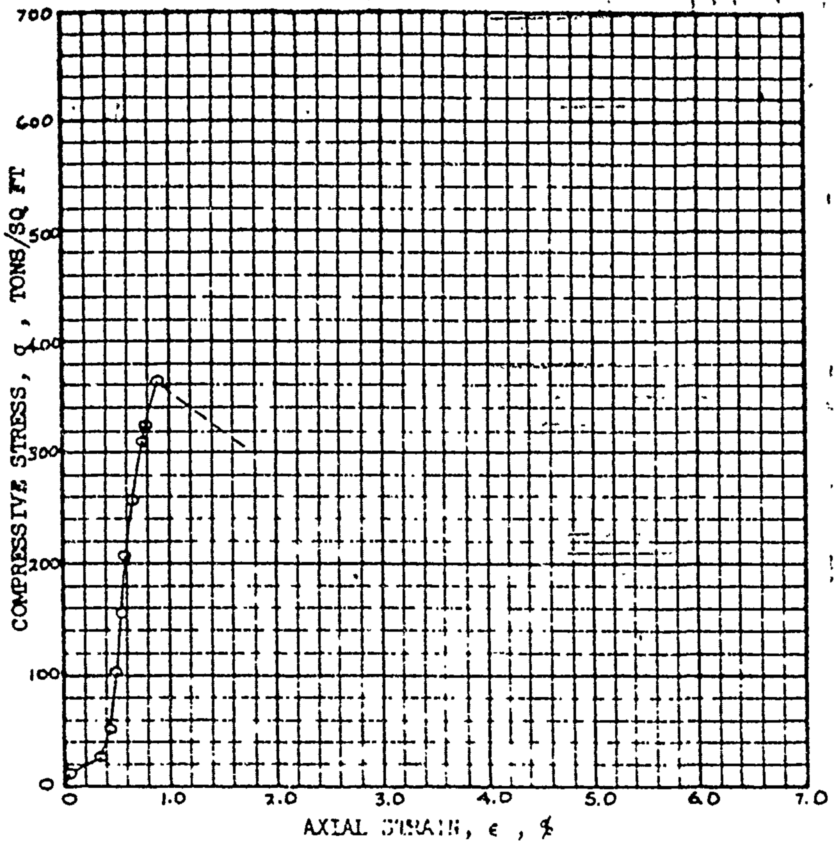
UNCONFINED COMPRESSION TEST REPORT

ENG FORM 3659 1 MAY 63 (TRANSLUCENT)

PLATE NO. 6
C 8827



Sketch of specimen after failure



TEST TYPE
(Check one)

☒ Controlled-stress
9,300 lbs/min.

☐ Controlled-strain

Type of specimen		☒ Undisturbed ☐ Remolded	Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	0.2 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	160			
Time to failure, min		t_f	15			
Unconfined compressive strength, tons/sq ft		q_u	353			
Undrained shear strength, tons/sq ft		s_u	177			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 6.0 in. Specimen Height 10.3 in.

Remarks

Project Diarks Dam

~~Area~~ Foundation Material

Boring No. 6DC-36 Sample No. M-3816

Depth, ~~ft~~ 340-349 Date OCT 64

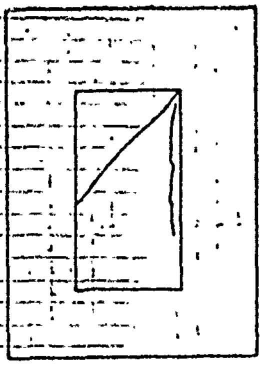
UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 3659 (TRANSLUCENT)

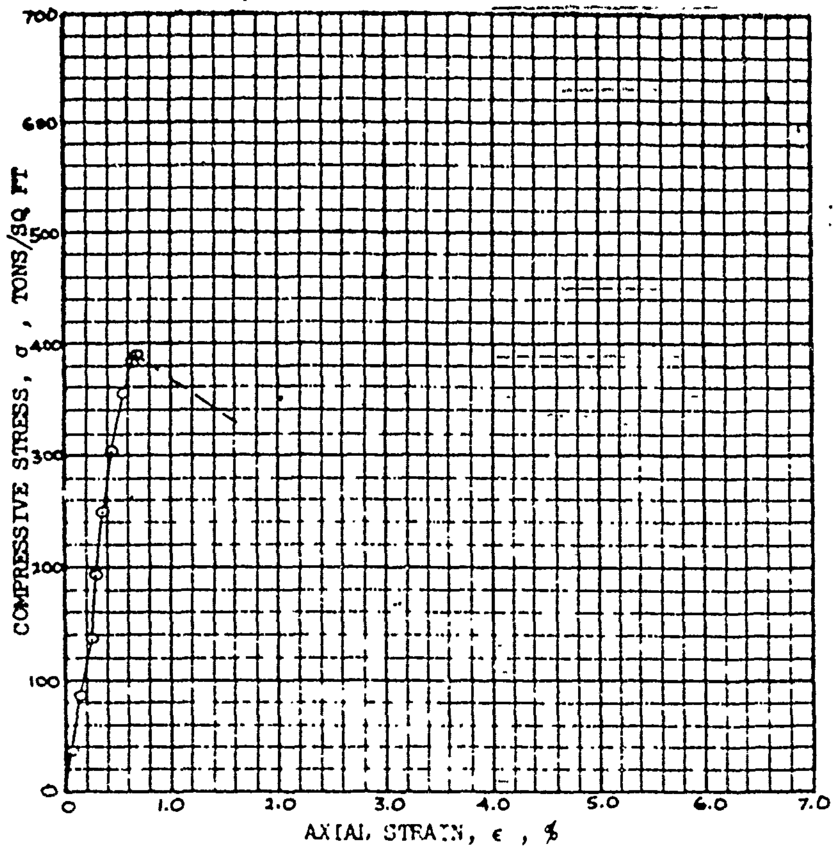
PLATE NO. 5

C 8927

PLATE XI-2 (4)



Sketch of specimen after failure



TEST TYPE
(Check one)

☒ Controlled-stress 15,000 lbs/min.

☐ Controlled-strain

Type of specimen ☒ Undisturbed ☐ Remolded			Test No.	Test No.	Test No	Test No.
Initial	Water content	w_o	0.7 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	158			
Time to failure, min		t_f	9			
Unconfined compressive strength, tons/sq ft		q_u	382			
Undrained shear strength, tons/sq ft		s_u	191			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 5.7 in. Specimen Height 10.3 in.

Remarks

Project Dierks Dam

Area Foundation Material

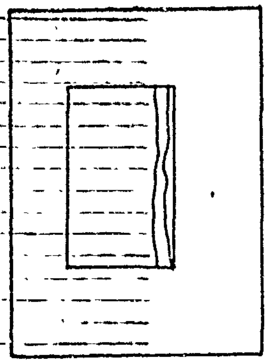
Boring No. FDC-36 Sample No. M-3814

Depth, ft 23.1-24.0 Date OCT 64

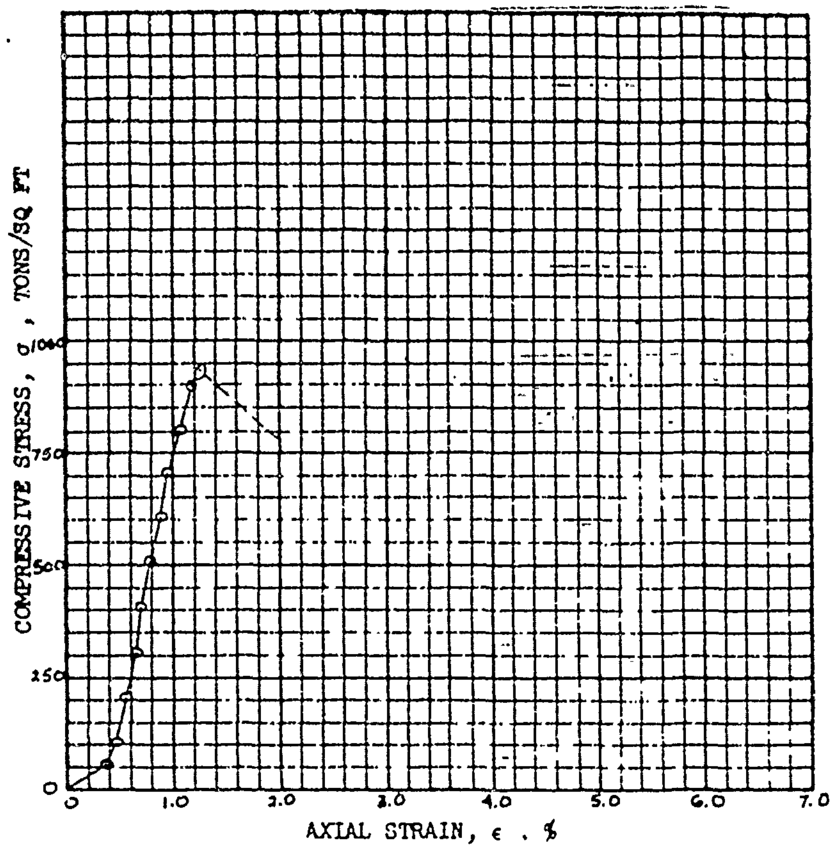
UNCONFINED COMPRESSION TEST REPORT

PLATE NO. 4
C 8927

ENG FORM 3659 1 MAY 63 (TRANSLUCENT)



Sketch of specimen after failure



TEST TYPE
(Check one)

☒ Controlled-stress 15,000 lbs/min.

☐ Controlled-strain

Type of specimen ☒ Undisturbed ☐ Remolded			Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	0.2 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	161			
Time to failure, min		t_f	25			
Unconfined compressive strength, tons/sq ft		q_u	905			
Undrained shear strength, tons/sq ft		s_u	453			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 6.0 in. Specimen Height 9.9 in.

Remarks

Project Dierks Dam

Foundation Material

Boring No. 6D2C-17 Sample No. M-3833

Depth, ft 41.9 - 42.8 Date OCT 84

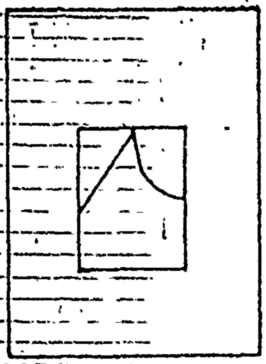
UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 3659 (TRANSLUCENT)

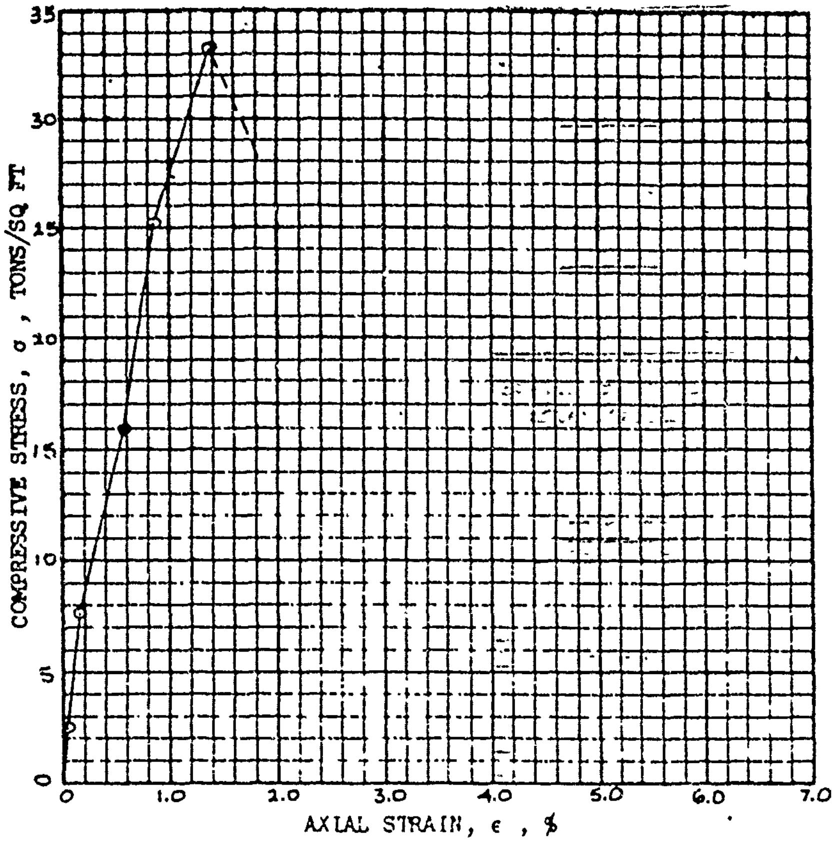
PLATE NO. 3 PLATE XI-2

C 6927

(6)



Sketch of specimen after failure



TEST TYPE
(Check one)

☒ Controlled-stress 1,500 lbs/min.

☐ Controlled-strain

Type of specimen	☒ Undisturbed ☐ Remolded		Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	4.2 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	144			
Time to failure, min		t_f	9			
Unconfined compressive strength, tons/sq ft		q_u	31.4			
Undrained shear strength, tons/sq ft		s_u	16.7			
Sensitivity ratio		S_t				

Classification SANDSTONE

LL	PL	PI	G_s

Specimen Diam 6.0 ~~cm~~ in. Specimen Height 7.8 ~~cm~~ in.

Remarks

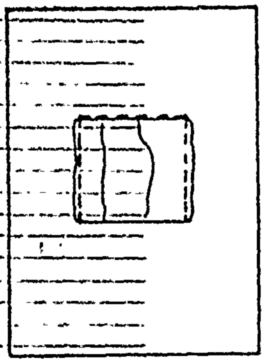
Project Dierks Dam

~~Area~~ Foundation Material

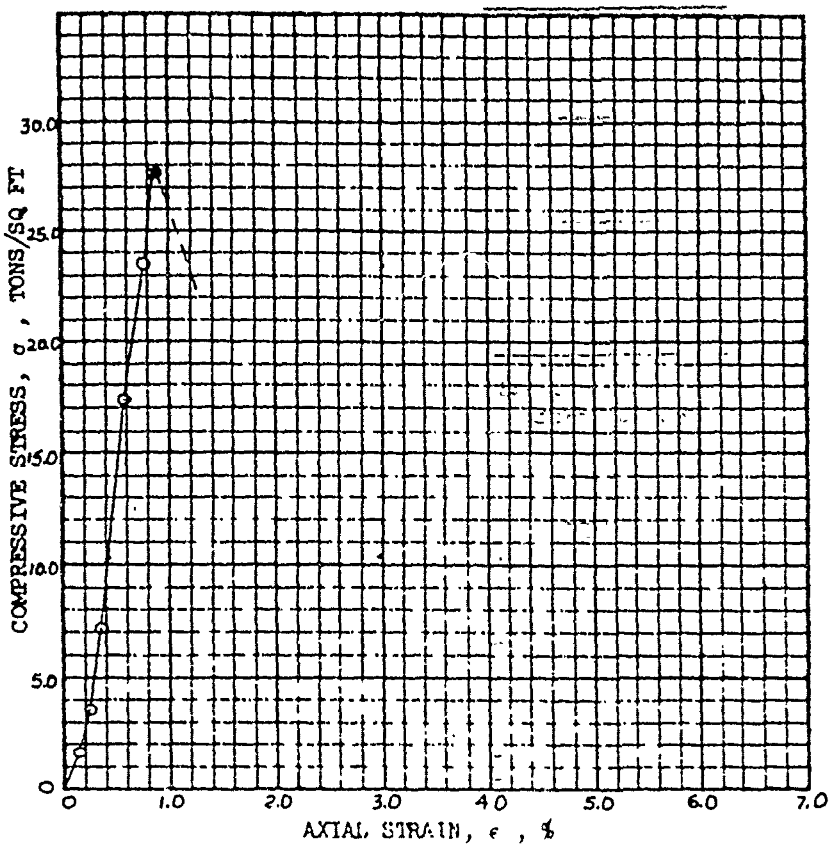
Boring No. 6D2C-17 Sample No. M-3104

Depth, ~~ft~~ 11.4-12.3 Date OCT 64

UNCONFINED COMPRESSION TEST REPORT



Sketch of specimen after failure



TEST TYPE
(Check one)

☑ Controlled-stress
232 lbs/min.

☐ Controlled-strain

Type of specimen ☑ Undisturbed ☐ Remolded			Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	9.9 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	133			
Time to failure, min		t_f	48			
Unconfined compressive strength, tons/sq ft		q_u	23.2			
Undrained shear strength, tons/sq ft		s_u	11.6			
Sensitivity ratio		S_t				

Classification SHALE

LL	PL	PI	G_s

Specimen Diam 6.0 in. Specimen Height 5.9 in.

Remarks

Project Dierks Dam

Area Foundation Material

Boring No. GS-13A Sample No. M-5069

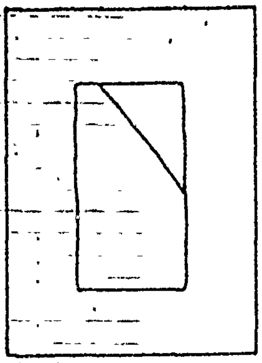
Depth, ~~El~~ 16.6-17.4 Date DEC 64

UNCONFINED COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 3659 (TRANSLUCENT)

PLATE NO. 1

C 8927

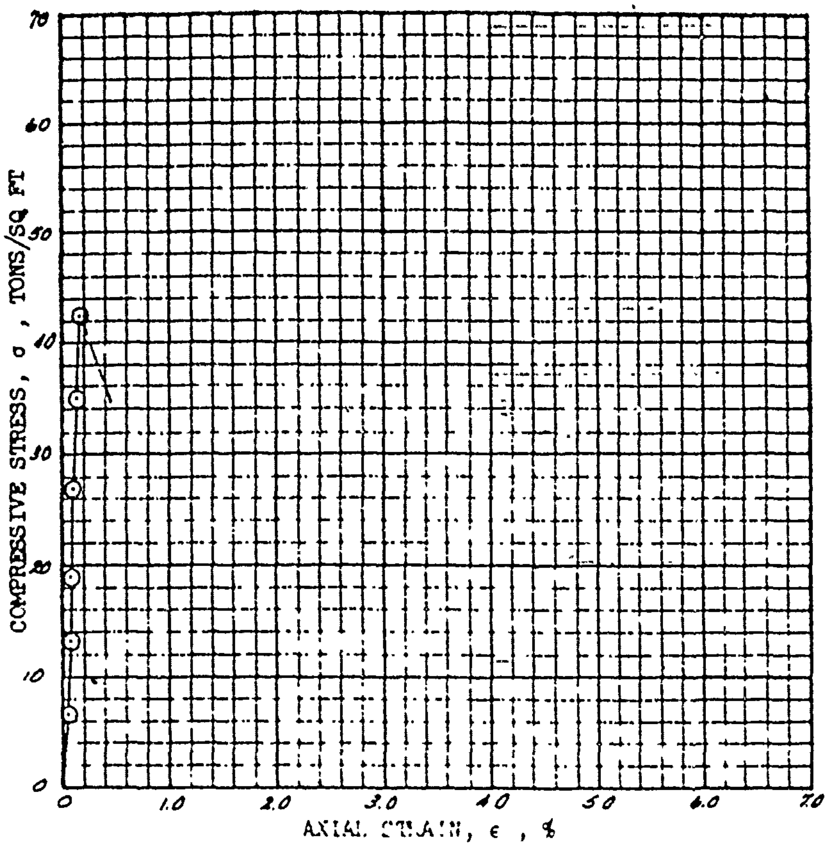


Sketch of specimen after failure

TEST TYPE
(Check one)

☑ Controlled-stress
Rate, 1.6 $\frac{psi}{sec}$

☐ Controlled-strain



Type of specimen	☑ Undisturbed ☐ Remolded		Test No.	Test No.	Test No.	Test No.
Initial	Water content	w_o	4.4 %	%	%	%
	Void ratio	e_o				
	Saturation	S_o	%	%	%	%
	Dry density, lb/cu ft	γ_d	150			
Time to failure, min		t_f	6			
Unconfined compressive strength, tons/sq ft		q_u	41.8			
Undrained shear strength, tons/sq ft		s_u	20.9			
Sensitivity ratio		S_t				

Classification SHALE

LL	PL	PI	G_s

Specimen Diam 4.0 in. Specimen Height 7.5 in.

Remarks ~~SHALE, black; contains gray,~~ hard, well cemented fine grained sandstone bands from hairline to 2" size, at 1½" to 3" intervals. Bedding dip is about 60°.

Project Dierks Dam

Area Foundation Material

Boring No. 190 Sample No. M-11,767

Depth, ft 70 Date SEP 65

UNCONFINED COMPRESSION TEST REPORT

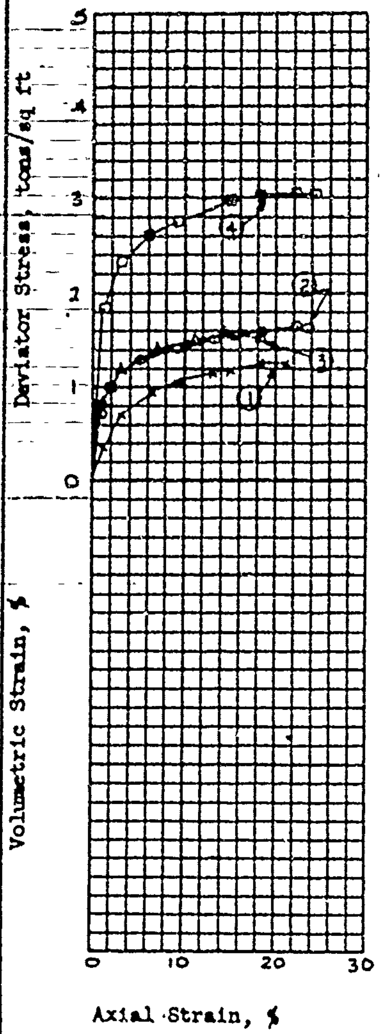
ENG FORM 1 MAY 63 3659 (TRANSLUCENT)

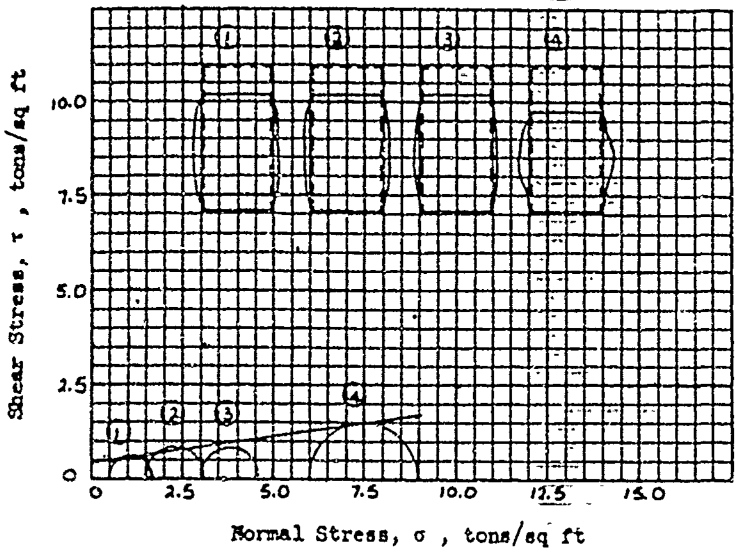
C 8927

APPENDIX D

FOUNDATION MATERIALS

SECTION 2. Q TRIAXIAL TESTS





Shear Values

ϕ = 8.1 °

tan ϕ = .142

c = 0.4 tons/sq ft

Test No.			①	②	③	④
Initial	Water content	w_o	16.9 %	17.2 %	17.5 %	16.5 %
	Void ratio	e_o	.480	.508	.523	.485
	Saturation	S_o	94 %	90 %	89 %	91 %
	Dry density lb/cu ft	γ_d	112.2	110.1	109.0	111.8
Before Test	Water content	w_c	%	%	%	%
	Saturation	S_c	%	%	%	%
	Consolidation press., tons/sq ft	σ_c				
	Void ratio	e_c				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Major principal stress, tons/sq ft		σ_1	1.68*	3.05*	4.57	8.99*
Minor principal stress, tons/sq ft		σ_3	0.5	1.5	3.0	6.0
Time to failure, min			23*	23*	21	23*
Initial diameter, ~~cm~~ in			1.4	1.4	1.4	1.4
Initial height, H_o, ~~cm~~ in			3.0	2.9	3.0	3.0

Type Test Q

Method of Saturation ______ ☐ Controlled Stress ☒ Controlled Strain

Type of specimen UNDISTURBED Rate of strain 0.01 in./min

Classification Silty SAND (SM)

LL NP | PL NP | PI NP | ~~D10~~ G 2.66

Remarks *At 15% strain

Project Dierks Dam

~~Area~~ Foundation Material

Boring No. GD2C-11 Sample No. M-2901*

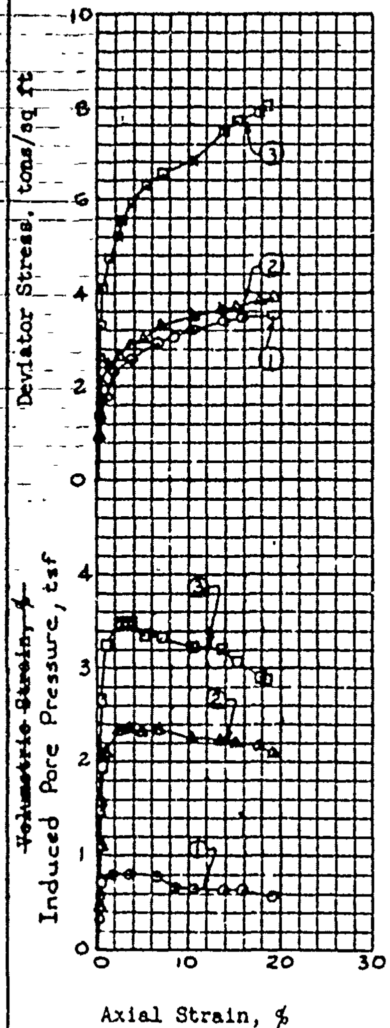
Depth ~~ft~~ 5.0 - 7.0 Date OCT 64

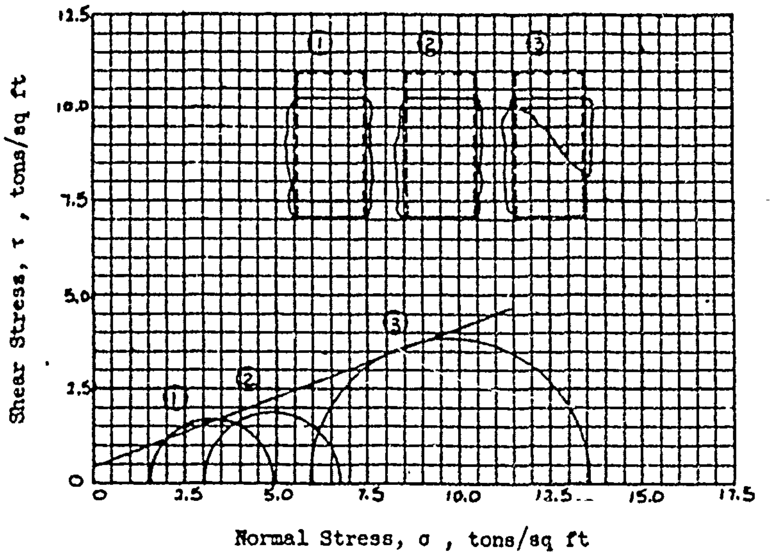
TRIAXIAL COMPRESSION TEST REPORT

APPENDIX D

FOUNDATION MATERIALS

SECTION 3. R TRIAXIAL TESTS





Shear Values

ϕ = 20.2 °

tan ϕ = .367

c = 0.5 tons/sq ft

Test No.			①	②	③	
Initial	Water content	w_o	17.9 %	17.9 %	16.3 %	%
	Void ratio	e_o	.523	.549	.498	
	Saturation	S_o	91 %	87 %	87 %	%
	Dry density lb/cu ft	γ_d	109.0	107.2	110.9	
Before Test	Water content	w_c	16.6 %	16.1 %	15.4 %	%
	Saturation	S_c	100 %	100 %	100 %	%
	Consolidation press., tons/sq ft	σ_c	1.55	3.05	5.95	
	Void ratio	e_c	.441	.427	.410	
Final	Water content	w_f	16.6 %	16.1 %	15.4 %	%
	Void ratio At Failure	e_f	.441	.427	.410	
Major principal stress, tons/sq ft		σ_1	4.95*	6.73*	13.54*	
Minor principal stress, tons/sq ft		σ_3	1.55	3.05	5.95	
Time to failure, min			205*	230*	235*	
Initial diameter, ~~cm~~ in			1.4	1.4	1.4	
Initial height, H_o, ~~cm~~ in			3.0	3.0	3.0	

Type Test R

Method of Saturation Back Pressure ☐ Controlled Stress ☑ Controlled Strain

Type of specimen UNDISTURBED Rate of strain 0.002(nominal) in./min

Classification Silty SAND (SM)

LL NP | PL NP | PI NP | ~~G_s~~ G 2.66

Remarks *At 15% strain

Project Dierks Dam

~~Area~~ Foundation Material

Boring No. 6D2C-11 Sample No. M-2901

Depth ~~El~~ 5.0-7.0 Date OCT 64

TRIAXIAL COMPRESSION TEST REPORT

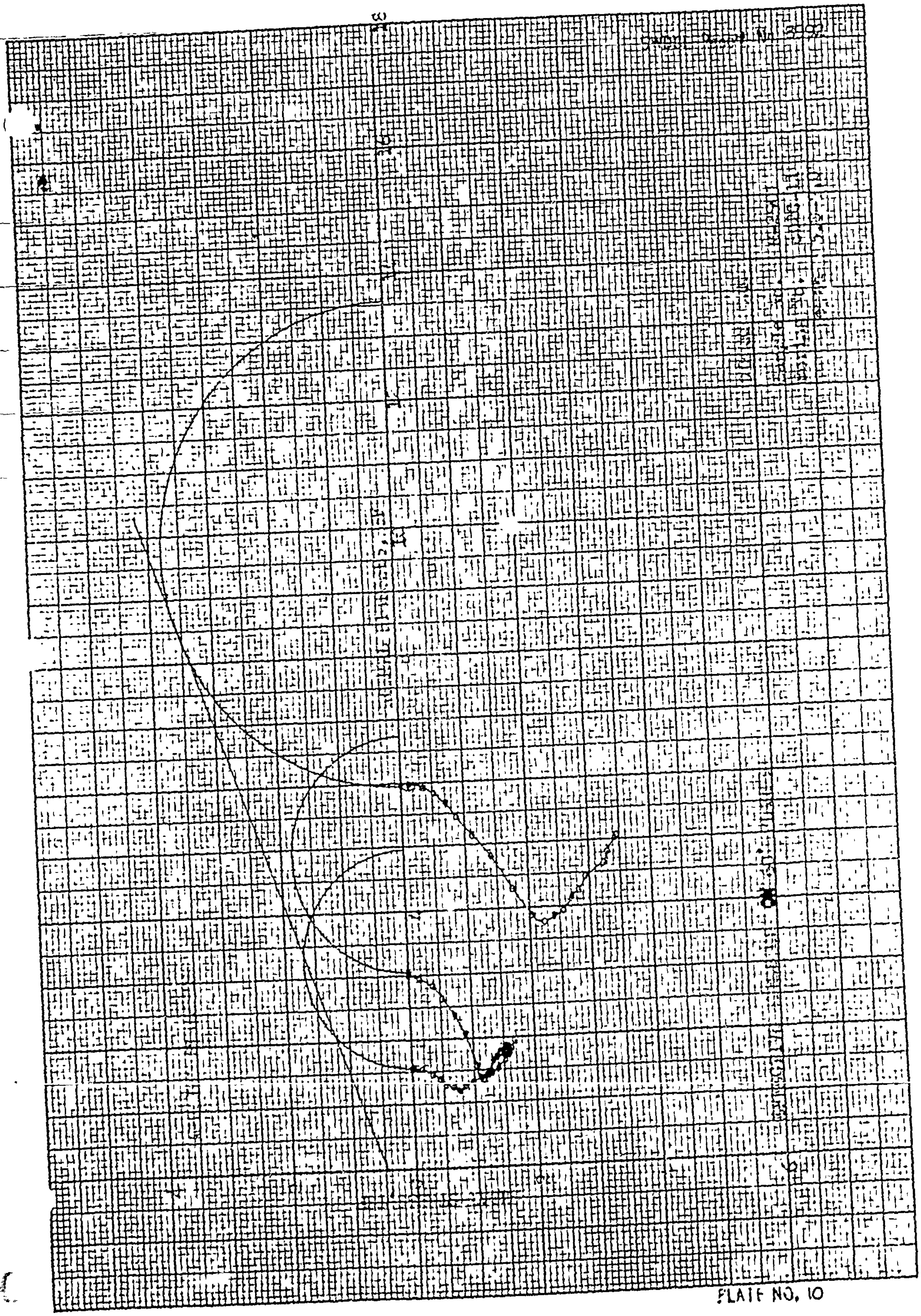
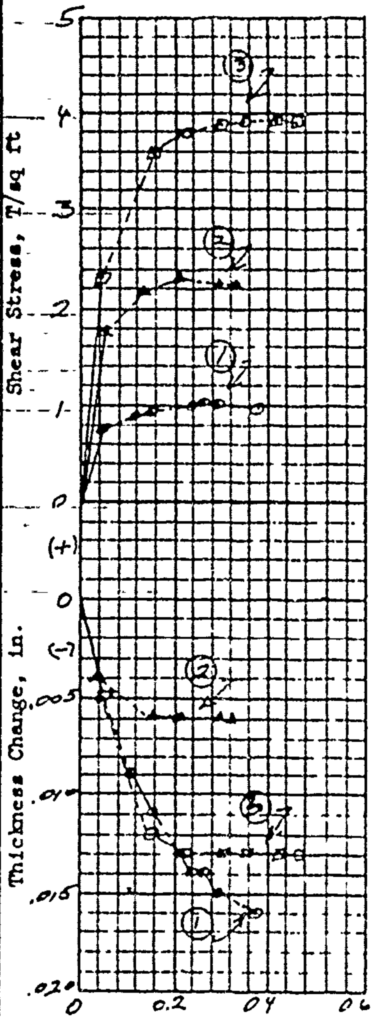


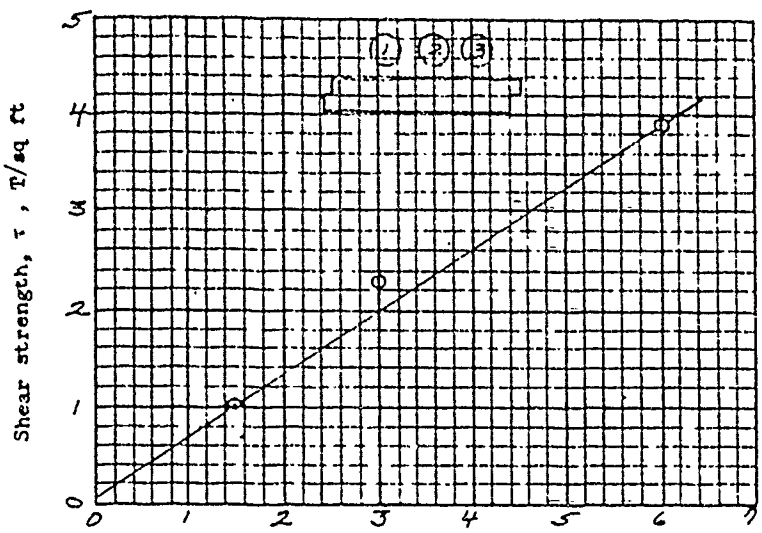
PLATE NO. 10

APPENDIX D

FOUNDATION MATERIALS

SECTION 4. DIRECT SHEAR TESTS





Test No.			1	2	3	
Initial	Water content	w_o	15.7 %	16.2 %	15.8 %	%
	Void ratio	e_o	.521	.546	.525	
	Saturation	S_o	80 %	79 %	80 %	%
	Dry density lb/cu ft	γ_d	109.2	107.4	108.9	
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}	—	—	< 1	
Final	Water content	w_f	14.5 %	14.9 %	14.5 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	3100	1900	4365	
Normal stress T/sq ft		σ	1.5	3.0	6.0	
Maximum shear strength, T/sq ft		τ	1.02	2.28	3.89	

Shear Values

ϕ' = 32.6

tan ϕ' = .638

c' = 0.1

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain

Type of Specimen UNDISTURBED | 3.0 in. Square | 0.5 in. Thickness

Classification silty SAND (SM)

LL NP | PL NP | PI NP | ~~D10~~ G_s 2.66

Remarks

Rate of shear: Test 1 .000009 in/min.
2 .00001 in/min.
3 .00001 in/min.

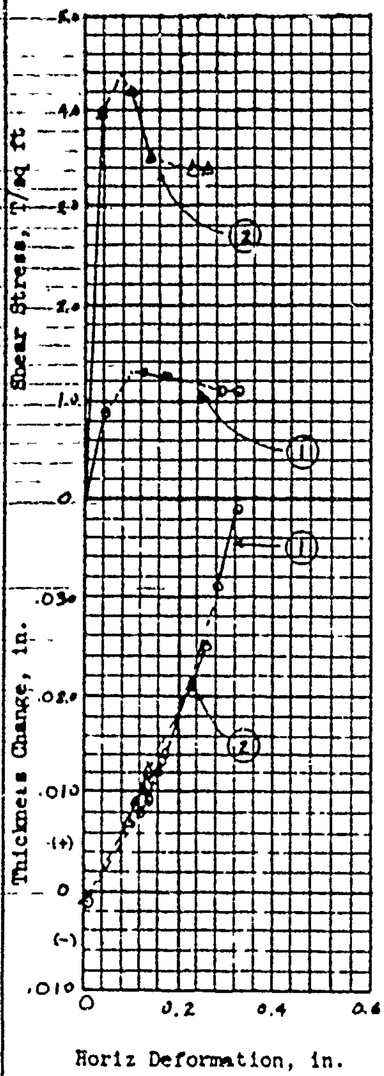
Project Dierks Dam

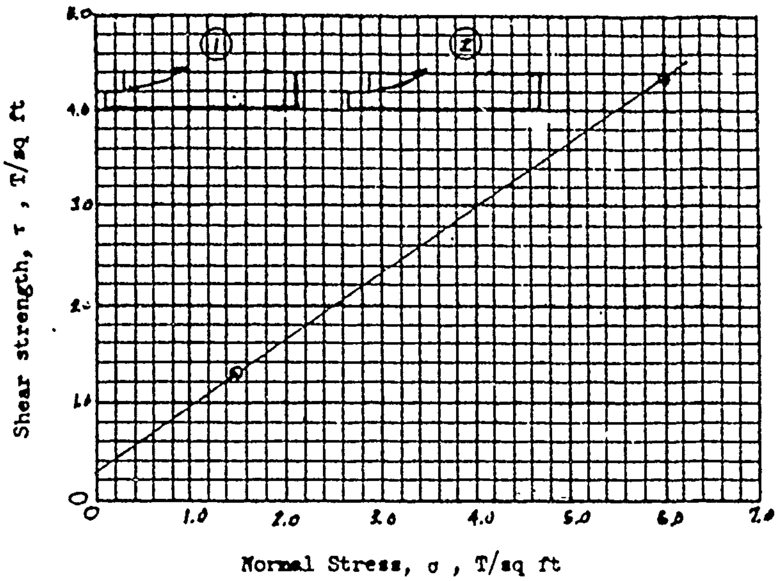
~~Area~~ Foundation Material

Boring No. 602C-11 | Sample No M-2901

Depth ~~ft~~ 5.0 - 7.0 | Date OCT 6?

DIRECT SHEAR TEST REPORT





Test No.			①	②		
Initial	Water content	w_o	8.3 %	8.7 %	%	%
	Void ratio	e_o	.250	.263		
	Saturation	S_o	91 %	92 %	%	%
	Dry density lb/cu ft	γ_d	136.8	135.4		
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}				
Final	Water content	w_f	9.4 %	9.7 %	%	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	900	900		
Normal stress T/sq ft		σ	1.5	6.0		
Maximum shear strength, T/sq ft		τ	1.28	4.35		

Shear Values

ø' = 34.3°

tan ø' = .681

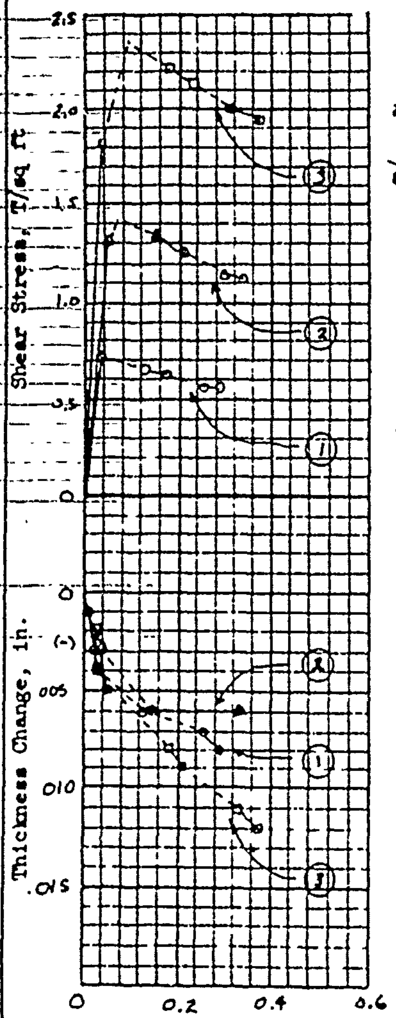
c' = 0.3

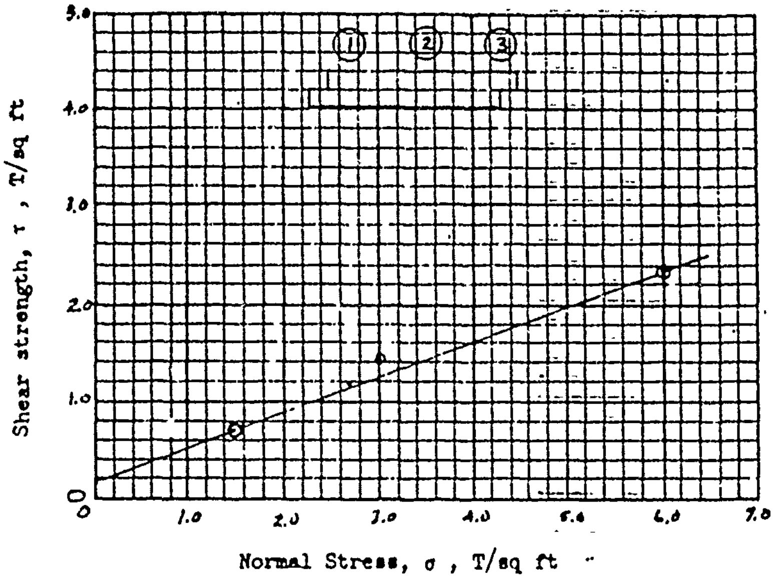
Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain, 0.0001 in/min. (nominal)

Type of Specimen UNDISTURBED	3.0 in. Square	0.5 in. Thickness
Classification SHALE		

LL 36	PL 20	PI 16	G 2.74

Remarks	Project Dierks Dam	
	Area Foundation [illegible]	
	Boring No. 6C-13A	Sample No. M-5070
	Depth ~~El~~ 18.3-19.0	Date DEC 6
	DIRECT SHEAR TEST REPORT	





Shear Values

φ' = 20.0°

tan φ' = .364

c' = 0.2

Test No.			1	2	3	
Initial	Water content	w_o	18.1 %	17.5 %	19.7 %	%
	Void ratio	e_o	.628	.650	.677	
	Saturation	S_o	80 %	72 %	81 %	%
	Dry density lb/cu ft	γ_d	106.2	104.8	103.1	
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}	–	–	1	
Final	Water content	w_f	25.5 %	24.2 %	22.0 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	365	700	1200	
Normal stress T/sq ft		σ	1.6	3.0	6.0	
Maximum shear strength, T/sq ft		τ	0.71	1.41	2.35	

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain, 0.0001 in./min (nominal)

Type of Specimen UNDISTURBED	3.0 in. Square	0.5 in. Thickness

Classification CLAY (CH) (weathered shale)

LL 54	PL 24	PI 30	~~D10~~ G 2.77

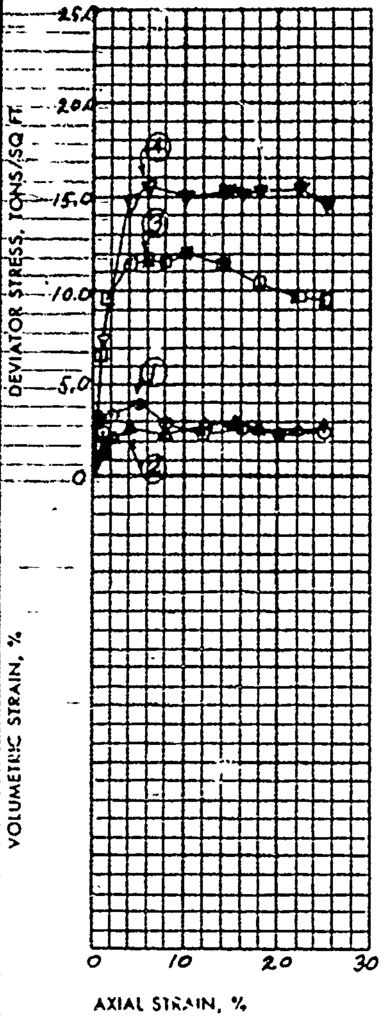
Remarks	Project Dierks Dam	
	Area Foundation Materials	
	Boring No. 6C-32-A	Sample No. M-8075
	Depth ~~El~~ 2.5 – 3.5	Date D[illegible] 1.4

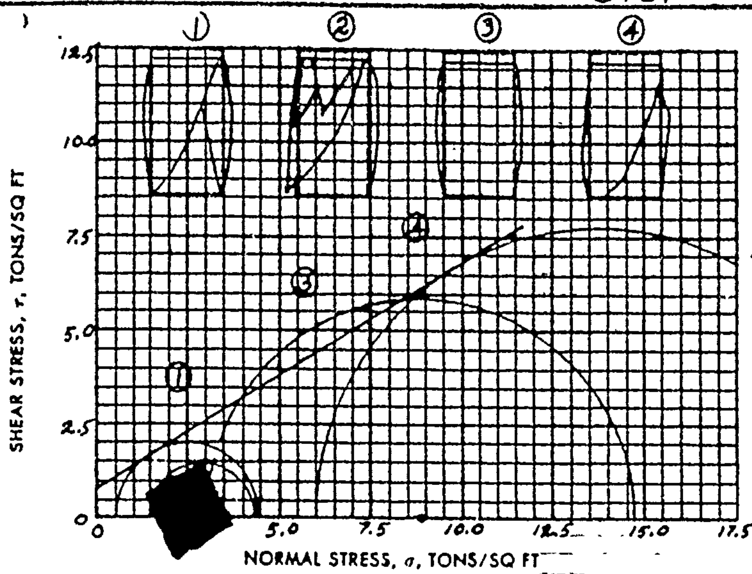
DIRECT SHEAR TEST REPORT

APPENDIX E

COMPACTED MATERIALS

SECTION 1. Q TRIAXIAL TESTS





SHEAR VALUES

φ = 30.9

TAN φ = .600

c = 0.8 TONS/SQ FT

	TEST NO		①	②	③	④
INITIAL	WATER CONTENT	w_o	11.5 %	11.6 %	11.5 %	11.6 %
	VOID RATIO	e_o	.426	.424	.410	.431
	SATURATION	S_o	72 %	73 %	75 %	72 %
	DRY DENSITY LB/CU FT	γ_d	116.9	117.0	118.2	116.3
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
	MAJOR PRINCIPAL STRESS, TONS/SQ FT	σ_1	4.49	4.29	14.65	21.62
	MINOR PRINCIPAL STRESS, TONS/SQ FT	σ_3	0.5	1.5	3.0	6.0
	TIME TO FAILURE MIN		9	8	12	13
	INITIAL DIAMETER ~~CM~~ IN		1.4	1.4	1.4	1.4
	INITIAL HEIGHT, H_o, ~~CM~~ IN		3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION ______ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN .015 IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 PL 15 PI 6 G_s 2.67

REMARKS ______

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. 8A-200 SAMPLE NO M-12,496 (γ,w)

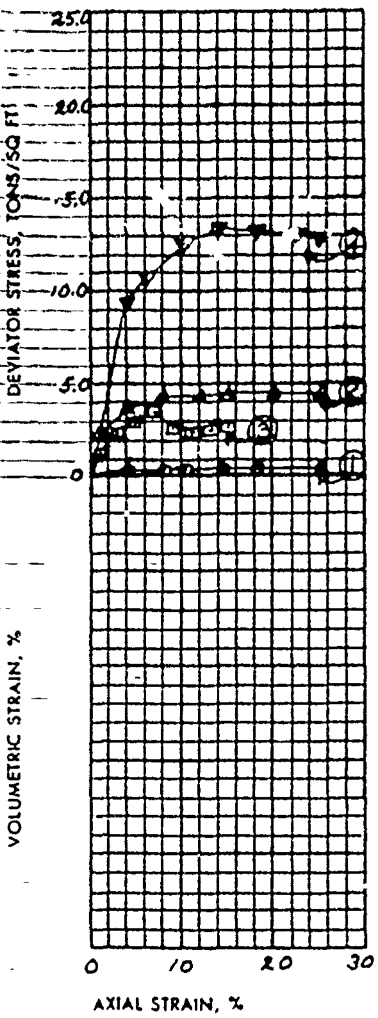
DEPTH ft 0.0-3.0 DATE NOV 65

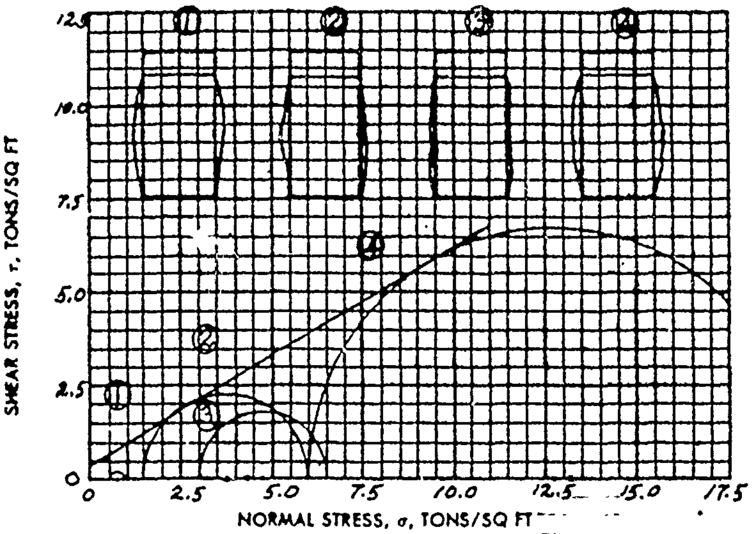
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) GPO 1964 OF-714-729

(4)

SWDGL Report 9467





TEST NO.			①	②	③	④
INITIAL	WATER CONTENT	w_o	14.9%	14.3%	14.6%	14.6%
	VOID RATIO	e_o	.514	.501	.505	.507
	SATURATION	S_o	77 %	76 %	77 %	77 %
	DRY DENSITY LB/CU FT	γ_d	110.1	111.1	110.8	110.6
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	0.92	5.94*	6.47	19.40
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			22	2.1*	17	25
INITIAL DIAMETER, ~~CM~~ IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~CM~~ IN			3.0	3.0	3.0	3.0

SHEAR VALUES

ϕ = 30.0

TAN ϕ = .577

c = 0.4 TONS/SQ FT

TYPE TEST Q

METHOD OF SATURATION ______ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded		RATE OF STRAIN .02 IN./MIN	
CLASSIFICATION CLAY, sandy (CL-ML)			
LL 21	PL 15	PI 6	G_s 2.67

REMARKS * At 15% strain

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. 8A-200 | SAMPLE NO. M-12,496 (95%, WT3)

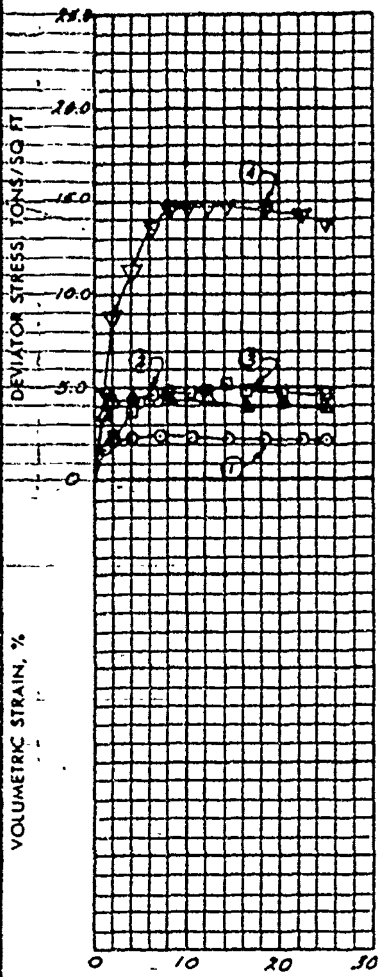
DEPTH ft 0.0-3.0 | DATE NOV 65

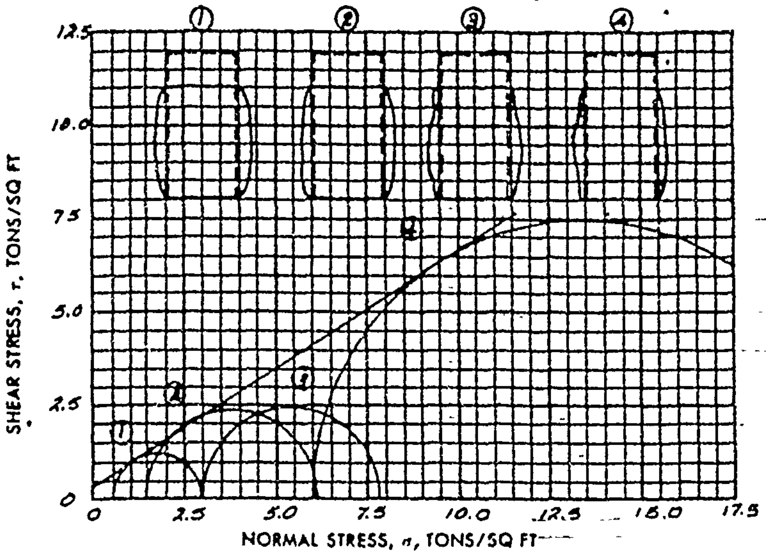
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO 1964 OF—714-729

Plate No. 16 (4-3)





TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	11.7 %	11.8 %	11.6 %	11.8 %
	VOID RATIO	e_o	.513	.506	.500	.514
	SATURATION	S_o	61 %	62 %	62 %	61 %
	DRY DENSITY LB/CU FT	γ_d	110.2	110.7	111.1	110.1
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.96	6.12	7.81	20.84
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			15	13	18	28
INITIAL DIAMETER, ~~CM~~ IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~CM~~ IN			3.0	3.0	3.0	3.0

SHEAR VALUES

ϕ = 32.0

TAN ϕ = .625

c = 0.4 TONS/SQ FT

TYPE TEST Q

METHOD OF SATURATION ______ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN .015 IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 | PL 15 | PI 6 | G_s 2.67

REMARKS

PROJECT Dierks Dam

AREA Borrow Material

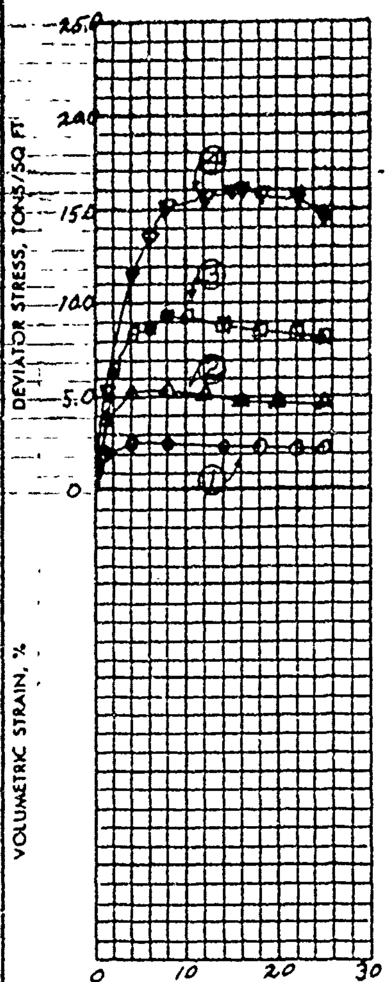
BORING NO. 8A-200 SAMPLE NO. (95%, w) M-12,496

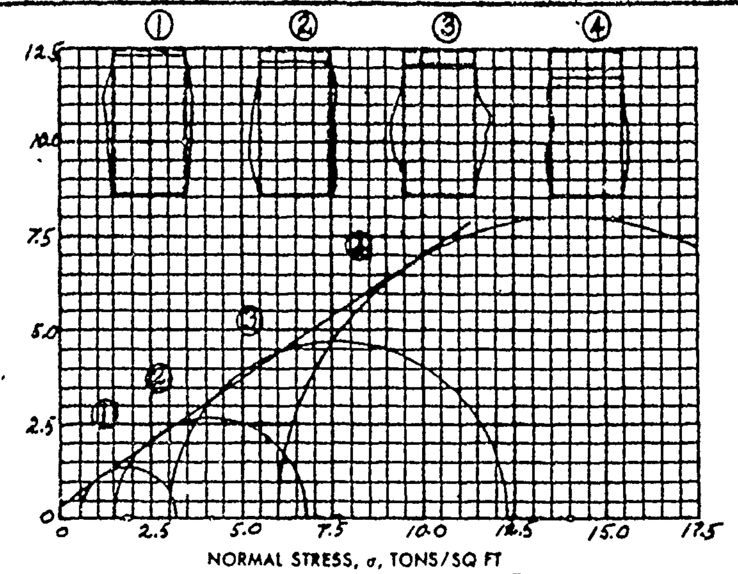
DEPTH 0.0-3.0 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)
1 MAY 63

GPO 1964 OF—714-789





SHEAR VALUES

φ = 33.2°

TAN φ = .654

c = 0.4 TONS/SQ FT

	TEST NO		①	②	③	④
INITIAL	WATER CONTENT	w_o	8.7 %	8.6 %	8.7 %	8.5 %
	VOID RATIO	e_o	.505	.505	.505	.504
	SATURATION	S_o	46 %	45 %	46 %	45 %
	DRY DENSITY LB/CU FT	γ_d	110.7	110.7	110.7	110.8
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.19	6.74	12.26	21.98*
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			8	16	14	33*
INITIAL DIAMETER, ~~CM~~ IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~CM~~ IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION ______ ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN .015 IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 | PL 15 | PI 6 | G_s 2.67

REMARKS * At 15% strain

PROJECT Dierks Dam

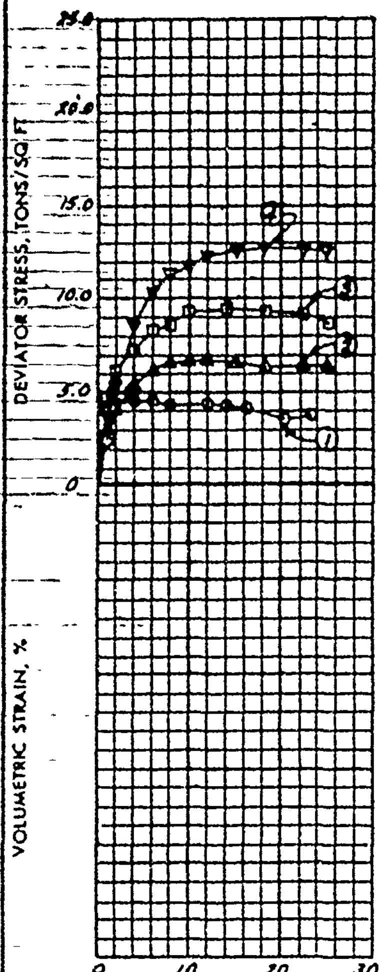
AREA Borrow Material

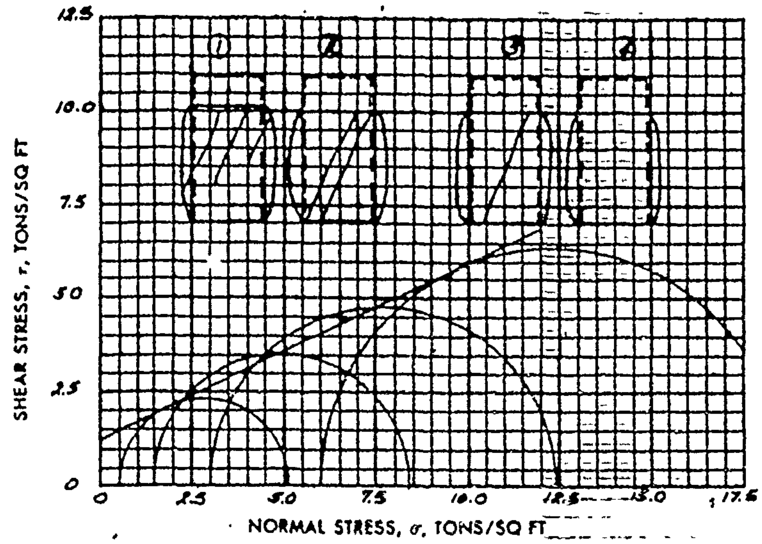
BORING NO. 8A-200 SAMPLE NO (958, W-3) M-12,496

DEPTH 0.0 - 3.0 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)
1 MAY 63





TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	12.8 %	12.8 %	12.8 %	12.8 %
	VOID RATIO	e_o	.447	.442	.433	.450
	SATURATION	S_o	77 %	78 %	80 %	77 %
	DRY DENSITY LB/CU FT	γ_d	116.0	116.5	117.2	115.8
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	5.09	8.35	12.47	18.73 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			7	20	23	25 *
INITIAL DIAMETER, IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, IN			3.0	3.0	3.0	3.0

SHEAR VALUES

φ = 25.2

tan φ = .470

c = .12 TONS/SQ FT

TYPE TEST Q

METHOD OF SATURATION

☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded

RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 G 2.69

REMARKS * At 15% Strain

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. 8A-203

SAMPLE NO. (T, W) M-12,500

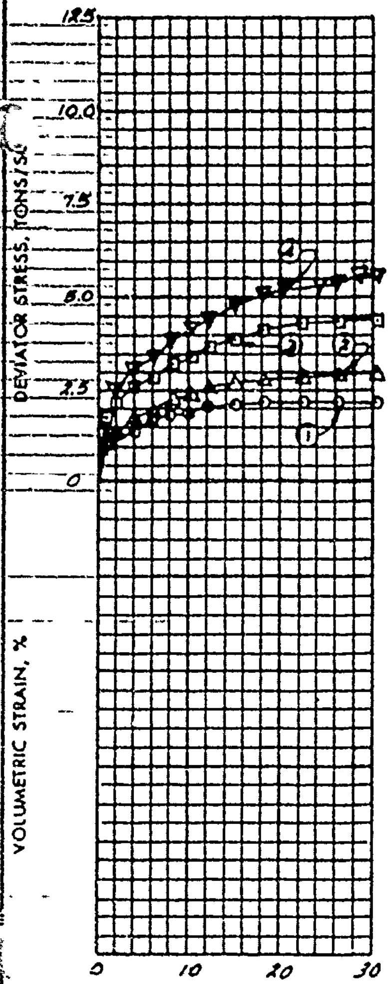
DEPTH 0.0-3.0

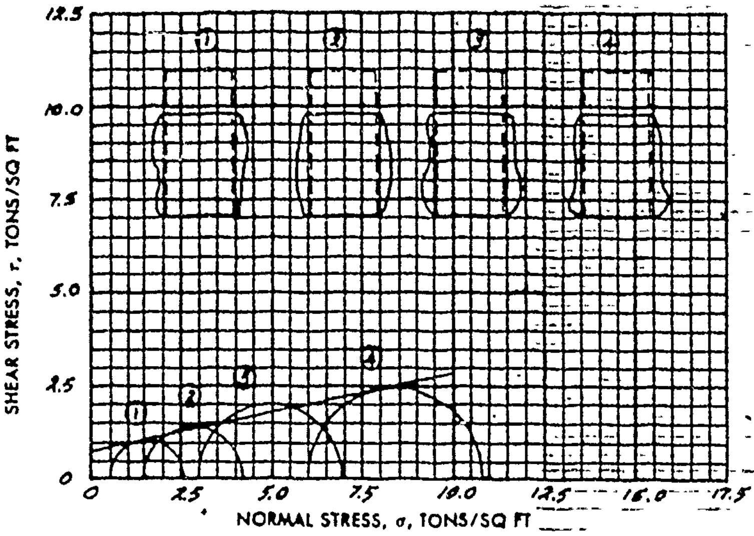
DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

GPO 1964 OF-714-129





SHEAR VALUES

φ = 11.4

TAN φ = .202

c = 0.7 TONS/SQ FT

TEST NO			1	2	3	4
INITIAL	WATER CONTENT	w_o	15.9 %	15.9 %	15.8 %	15.7 %
	VOID RATIO	e_o	.525	.522	.515	.528
	SATURATION	S_o	81 %	82 %	83 %	80 %
	DRY DENSITY LB/CU FT	γ_d	110.1	110.3	110.9	109.9
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.57 *	4.20 *	6.92 *	10.78 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			29 *	29 *	29 *	29 *
INITIAL DIAMETER, ~~CM~~ IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~CM~~ IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION

☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.015 IN./MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 G_s 2.69

REMARKS * At 15% Strain

PROJECT Dierks Dam

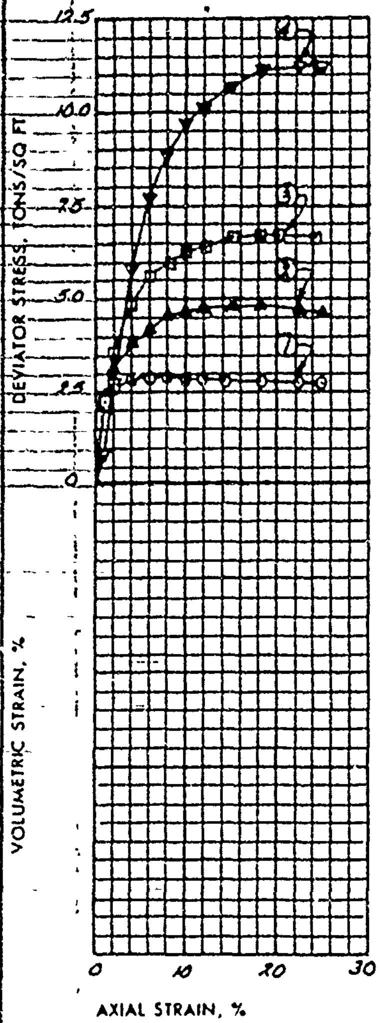
AREA Borrow Material

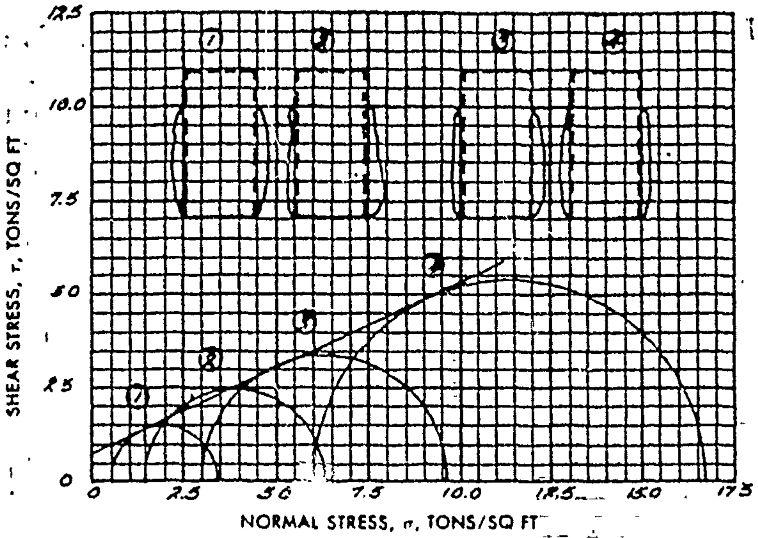
BORING NO. 8A-203 SAMPLE NO. (95 l, w+3) M-12,500

DEPTH FT 0.0 - 3.0 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1964 OF-714-720





SHEAR VALUES

φ = 24.4

TAN φ = .454

c = 0.7 TONS/SQ FT

				①	②	③	④
TEST NO				①	②	③	④
INITIAL	WATER CONTENT	w_o		12.9 %	12.9 %	12.9 %	12.9 %
	VOID RATIO	e_o		.526	.525	.521	.532
	SATURATION	S_o		66 %	66 %	67 %	65 %
	DRY DENSITY LB/CU FT	γ_d		110.0	110.1	110.4	109.6
BEFORE TEST	WATER CONTENT	w_c		%	%	%	%
	SATURATION	S_c		%	%	%	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c					
	VOID RATIO	e_c					
FINAL	WATER CONTENT	w_f		%	%	%	%
	VOID RATIO	e_f					
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1		3.48	6.31*	9.61*	16.69*
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3		0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN				14	24*	24*	24*
INITIAL DIAMETER, IN				1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, IN				3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION ______ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 G_s 2.69

REMARKS *At 15% Strain

PROJECT Dierks Dam

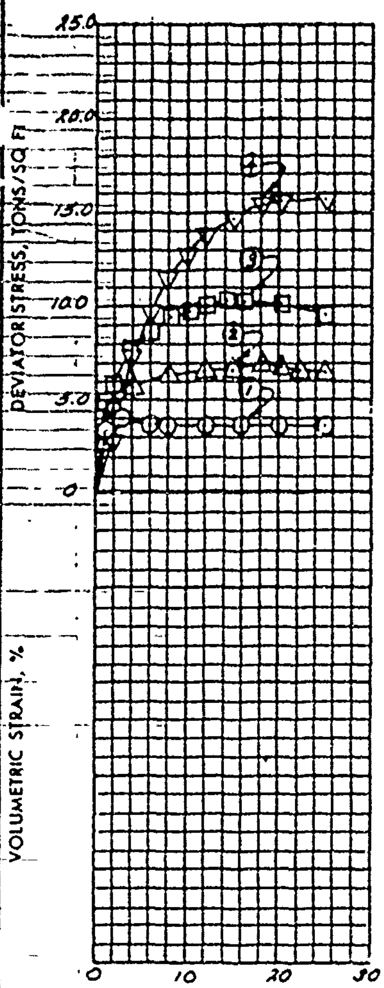
AREA Borrow Material

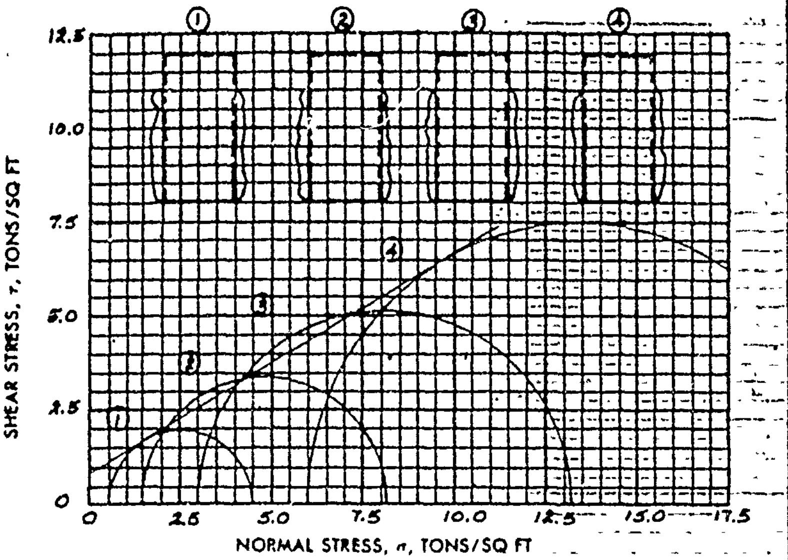
BORING NO. 8A-203 SAMPLE NO (95%, W) M-12,500

DEPTH ft 0.0-3.0 DATE NOV 63

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)





SHEAR VALUES

φ = 29.8

TAN φ = .573

c = 0.9 TONS/SQ FT

			TEST NO	①	②	③	④
INITIAL	WATER CONTENT	w_o	10.2 %	10.2 %	10.1 %	10.3 %
INITIAL	VOID RATIO	e_o	.535	.531	.527	.540
INITIAL	SATURATION	S_o	51 %	52 %	52 %	51 %
INITIAL	DRY DENSITY LB/CU FT	γ_d	109.4	109.7	110.0	109.1
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
BEFORE TEST	SATURATION	S_c	%	%	%	%
BEFORE TEST	CONSOLIDATION PRESS, TONS/SQ FT	σ_c				
BEFORE TEST	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
FINAL	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	4.50	8.16*	13.19	20.83*
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			9	45*	39	50*
INITIAL DIAMETER, IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION ______ ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 001 IN/MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 Gs G 2.69

REMARKS * At 15% Strain

PROJECT Dierks Dam

AREA Borrow Material

BORING NO. 8A-203 SAMPLE NO. (958, W-3) M-12,500

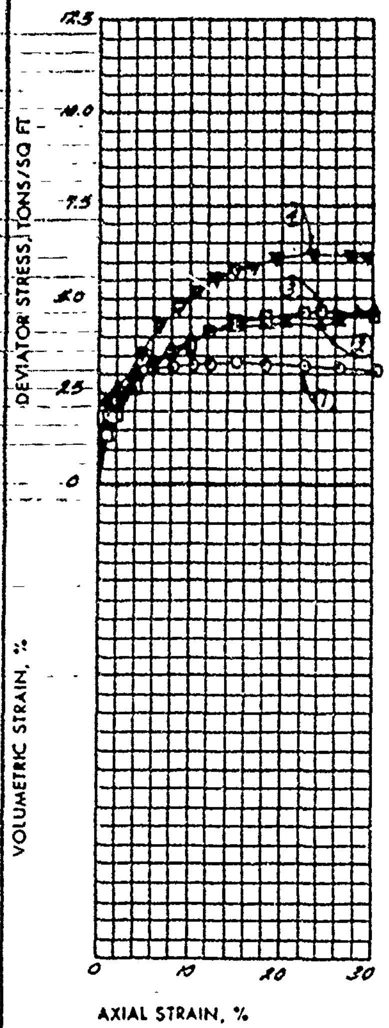
DEPTH 0.0-3.0 DATE NOV

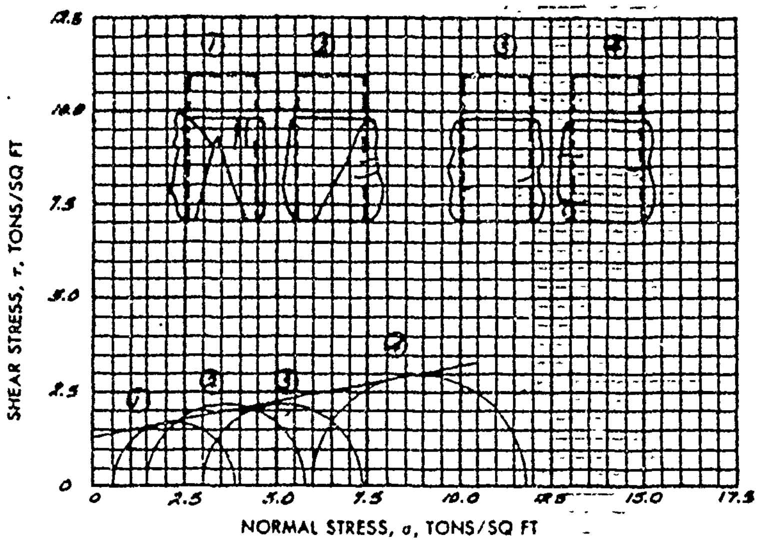
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) GPO 1964 OF—714-789

(52)

Plate No. 22





	TEST NO		①	②	③	④
INITIAL	WATER CONTENT	w_o	16.8 %	16.2 %	16.3 %	16.7 %
	VOID RATIO	e_o	.584	.573	.574	.586
	SATURATION	S_o	78 %	77 %	77 %	77 %
	DRY DENSITY LB/CU FT	γ_d	106.8	107.6	107.5	106.7
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.38 *	5.78 *	7.40 *	11.84 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			23 *	23 *	23 *	24 *
INITIAL DIAMETER, ~~CM~~ IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~CM~~ IN			3.0	3.0	3.0	3.0

SHEAR VALUES

ϕ = 10.5 °

TAN ϕ = .185

c = 1.3 TONS/SQ FT

TYPE TEST Q

METHOD OF SATURATION ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION CLAY (CL)

LL 40 | PL 13 | PI 27 | G_s 2.71

REMARKS * At 15 % Strain

PROJECT Diercks Dam

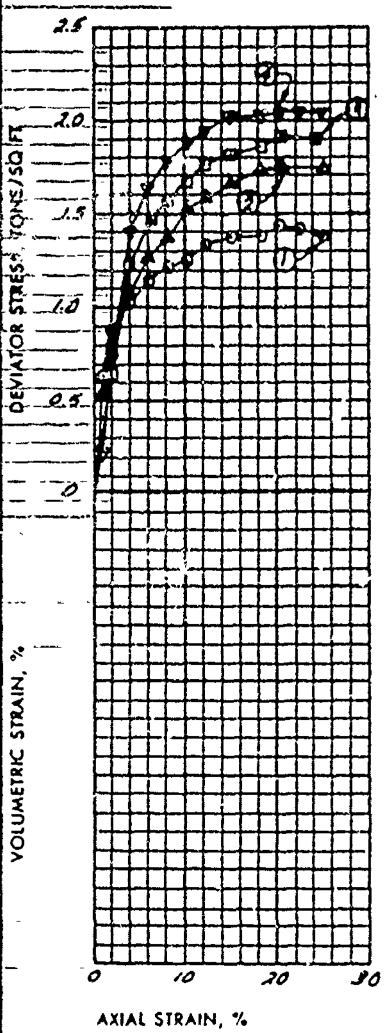
AREA Borrow Material

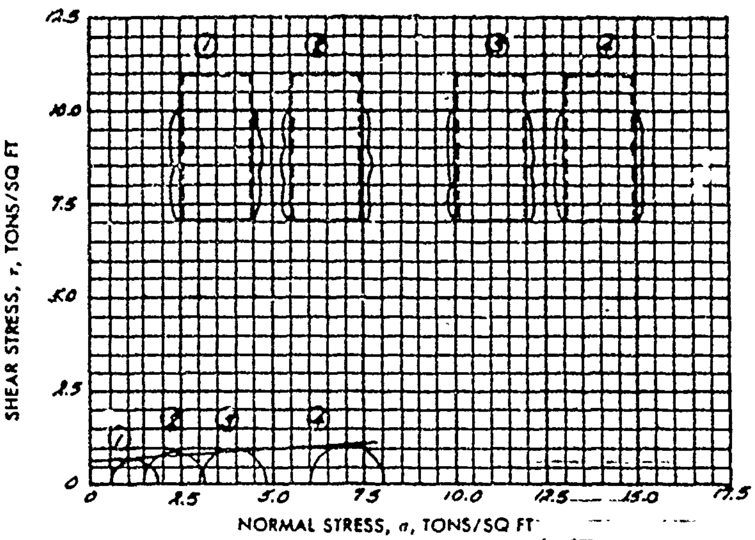
BORING NO. BA-207 SAMPLE NO. (γ, ω) M-12,504

DEPTH 5.0-6.5 DATE NOV 68

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1964 OF-714-719





SHEAR VALUES

φ= 3.1

TAN φ= .054

c= 0.6 TONS/SQ FT

TEST NO.			1	2	3	4
INITIAL	WATER CONTENT	w_o	19.9 %	19.5 %	19.4 %	19.7 %
	VOID RATIO	e_o	.676	.675	.671	.678
	SATURATION	S_o	80 %	78 %	78 %	79 %
	DRY DENSITY LB/CU FT	γ_d	101.0	101.0	101.2	100.8
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	1.88 *	3.16 *	4.81 *	8.01 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			24 *	23 *	25 *	24 *
INITIAL DIAMETER, IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION ______ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION CLAY (CL)

LL 40 | PL 13 | PI 27 | G_s 2.71

REMARKS * At 15% Strain

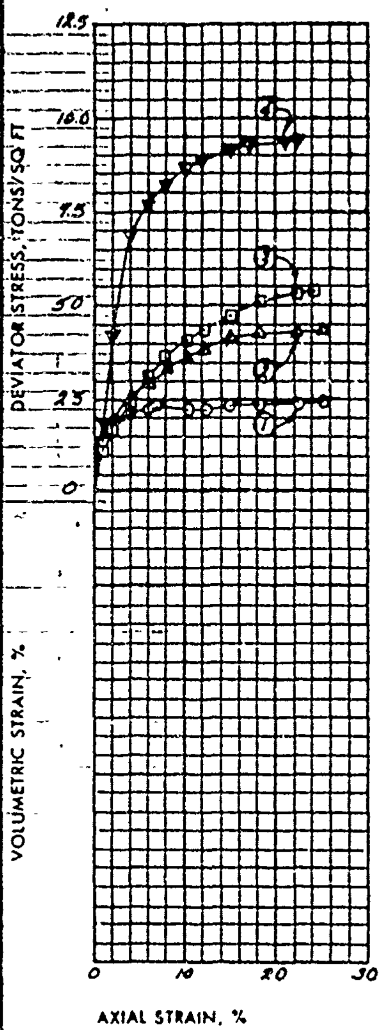
PROJECT Diecks Dam

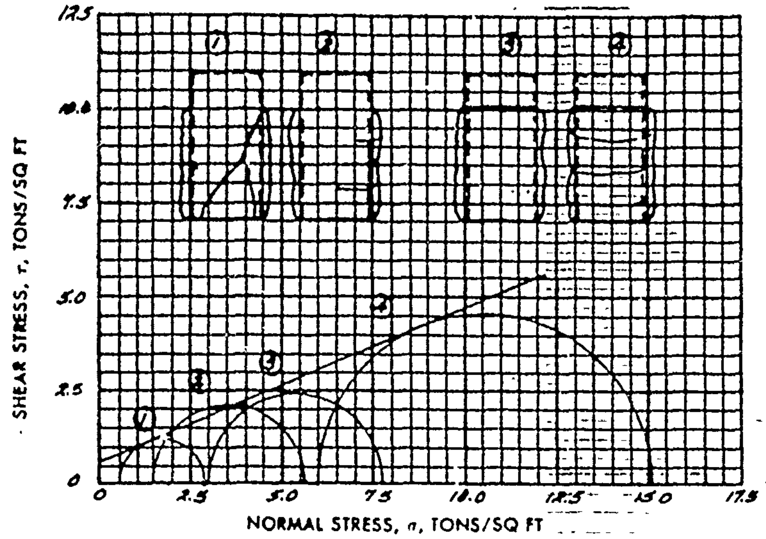
AREA Borrow Material

BORING NO. BA-207 SAMPLE NO. (95', w+3) M-12.504

DEPTH 5.0-6.5 DATE NOV 85

TRIAXIAL COMPRESSION TEST REPORT





SHEAR VALUES

φ = 22.3

TAN φ = .410

c = 0.6 TONS/SQ FT

	TEST NO.		①	②	③	④
INITIAL	WATER CONTENT	w_o	16.0 %	16.2 %	16.7 %	16.6 %
	VOID RATIO	e_o	.670	.659	.667	.679
	SATURATION	S_o	65 %	67 %	68 %	66 %
	DRY DENSITY LB/CU FT	γ_d	101.3	102.0	101.5	100.7
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.88 *	5.61 *	7.74 *	15.09 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			23 *	23 *	23 *	22 *
INITIAL DIAMETER, ~~CM~~ IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~CM~~ IN			3.0	3.0	3.0	3.0

TYPE TEST Q

METHOD OF SATURATION

☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN .002 IN/MIN

CLASSIFICATION CLAY (CL)

LL 40 PL 13 PI 27 G_s 2.71

REMARKS * At 15 % Strain

PROJECT Dierks Dam

AREA Borrow M-1

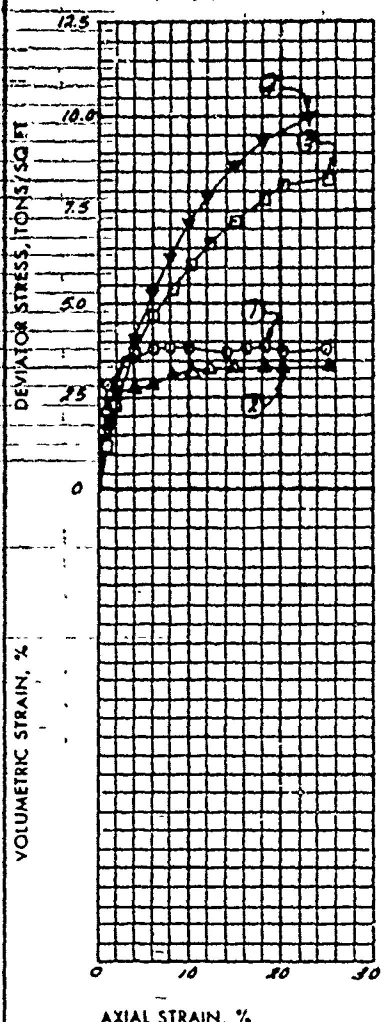
BORING NO. BA-207 SAMPLE NO. (95 I, W) M-12,504

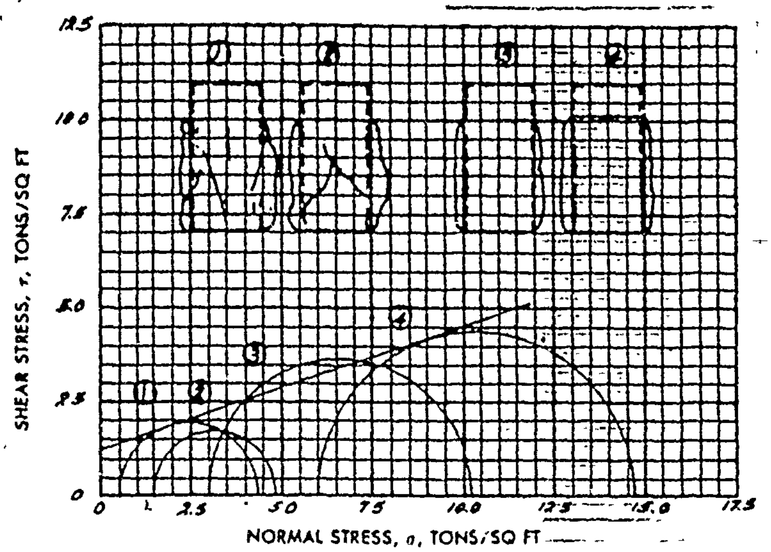
DEPTH 5.0-6.5 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT) GPO 1964 OF—714-789

SWDGL Report 9167





TEST NO			1	2	3	4
INITIAL	WATER CONTENT	w_o	13.4 %	13.7 %	13.6 %	13.7 %
	VOID RATIO	e_o	.661	.664	.658	.672
	SATURATION	S_o	55 %	56 %	56 %	55 %
	DRY DENSITY LB/CU FT	γ_d	101.9	101.7	102.0	101.2
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	4.35	4.83 *	10.24 *	14.67 *
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			13	24 *	25 *	26 *
INITIAL DIAMETER, IN			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, IN			3.0	3.0	3.0	3.0

SHEAR VALUES

ϕ = 17.7

TAN ϕ = .319

c = 1.2 TONS/SQ FT

TYPE TEST Q

METHOD OF SATURATION ____ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN/MIN

CLASSIFICATION CLAY (CL)

LL 40 PL 13 PI 27 G_s 2.71

REMARKS * At 15 % Strain

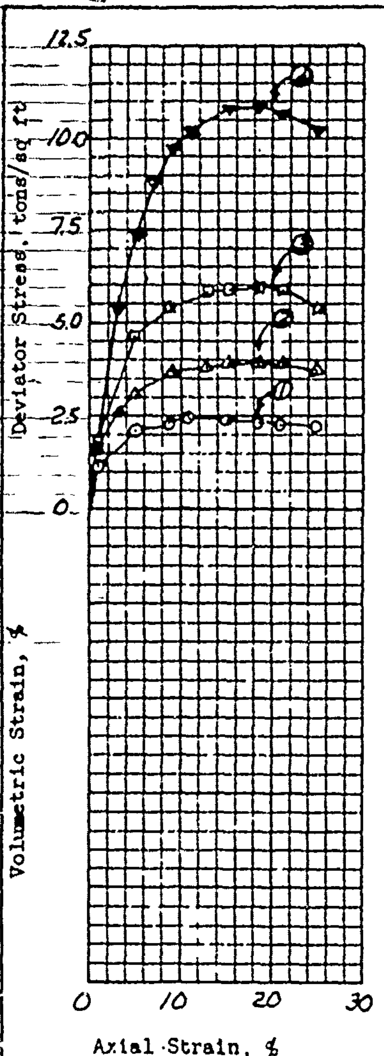
PROJECT Dierks Dam

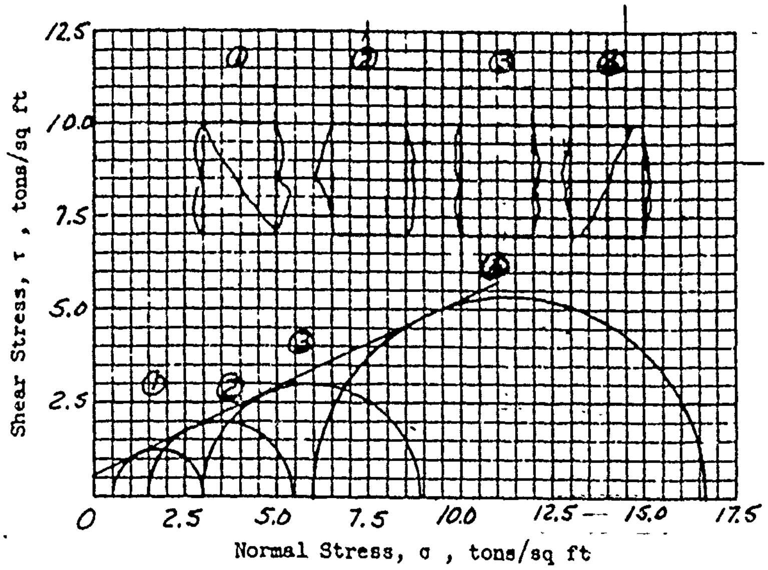
AREA Borrow Material

BORING NO 8A-207 SAMPLE NO. (956, W-3) M-12,504

DEPTH 5.0-6.5 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT





Shear Values

ϕ = 25.4 °

tan ϕ = .475

c = 0.6 tons/sq ft

Test No.			1	2	3	4
Initial	Water content	w_o	11.2 %	11.1 %	11.4 %	11.2 %
	Void ratio	e_o	.450	.454	.452	.460
	Saturation	S_o	67 %	66 %	67 %	65 %
	Dry density lb/cu ft	γ_d	115.4	115.1	115.3	114.8
Before Test	Water content	w_c	%	%	%	%
	Saturation	S_c	%	%	%	%
	Consolidation press., tons/sq ft	σ_c				
	Void ratio	e_c				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Major principal stress, tons/sq ft		σ_1	2.98	5.47*	8.87*	16.71*
Minor principal stress, tons/sq ft		σ_3	0.5	1.5	3.0	6.0
Time to failure, min			18	27 *	32 *	25 *
Initial diameter, in.			1.4	1.4	1.4	1.4
Initial height, H_o, in.			3.0	3.0	3.0	3.0

Type Test Q

Method of Saturation ______ ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded — Rate of strain 0.02 (Nominal) in./min

Classification SILT, sandy (ML)

LL 17 — PL 13 — PI 4 — G 2.68

Remarks * At 15% strain.

** Composite of samples # M-12,508, 12,509, 12,510, & 12,511

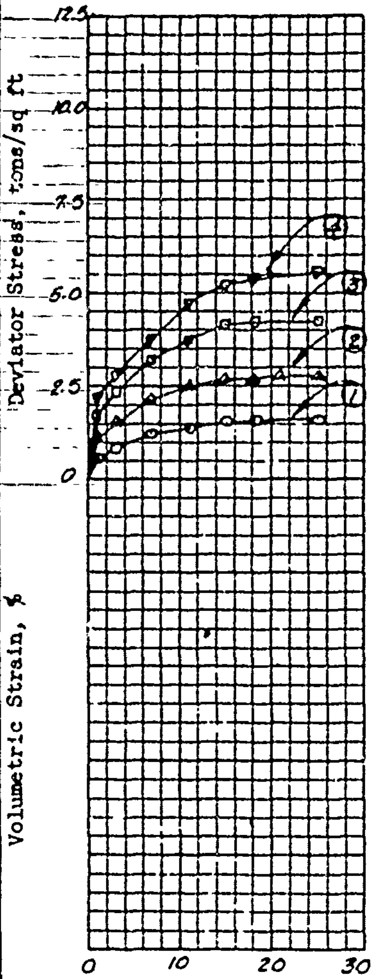
Project DIERKS DAM

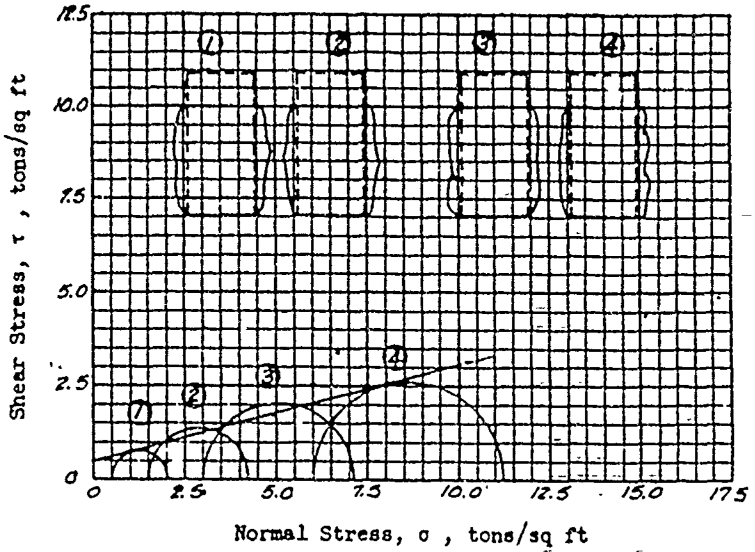
Area Borrow Material

Boring No. 6DC-165 — Sample No. M-12,508C ** (938 W)

Depth 2.4 - 11.1 — Date FEB 66

TRIAXIAL COMPRESSION TEST REPORT





Shear Values

ϕ = 14.5 °

tan ϕ = .258

c = 0.5 tons/sq ft

Test No.			①	②	③	④
Initial	Water content	w_o	14.0 %	13.8 %	13.9 %	14.0 %
	Void ratio	e_o	.454	.453	.449	.463
	Saturation	S_o	83 %	82 %	83 %	81 %
	Dry density lb/cu ft	γ_d	115.2	115.2	115.6	114.4
Before Test	Water content	w_c	%	%	%	%
	Saturation	S_c	%	%	%	%
	Consolidation press., tons/sq ft	σ_c				
	Void ratio	e_c				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Major principal stress, tons/sq ft		σ_1	2.01*	4.14*	7.07*	11.19*
Minor principal stress, tons/sq ft		σ_3	0.5	1.5	3.0	6.0
Time to failure, min			26*	25*	24*	26*
Initial diameter,			1.4	1.4	1.4	1.4
Initial height, H_o,			3.0	3.0	3.0	3.0

Type Test Q

Method of Saturation ______ ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded | Rate of strain 0.02 in./min

Classification SILT, sandy (ML)

LL 17 | PL 13 | PI 4 | G 2.68

Remarks * At 15 % strain
** Composite of samples # M-12,508, 12,509, 12,510, & 12,511

Project Dierks Dam

Area Borrow Material

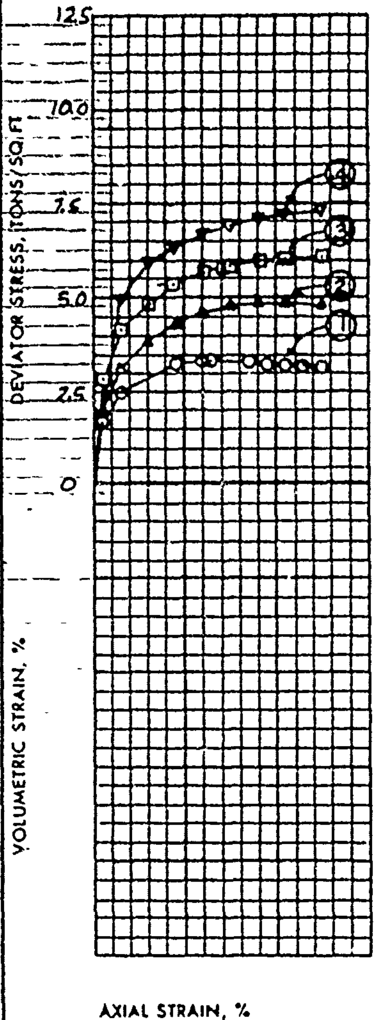
Boring No. 6DC-165 | Sample No. M-12,508 C** (958, W+3)

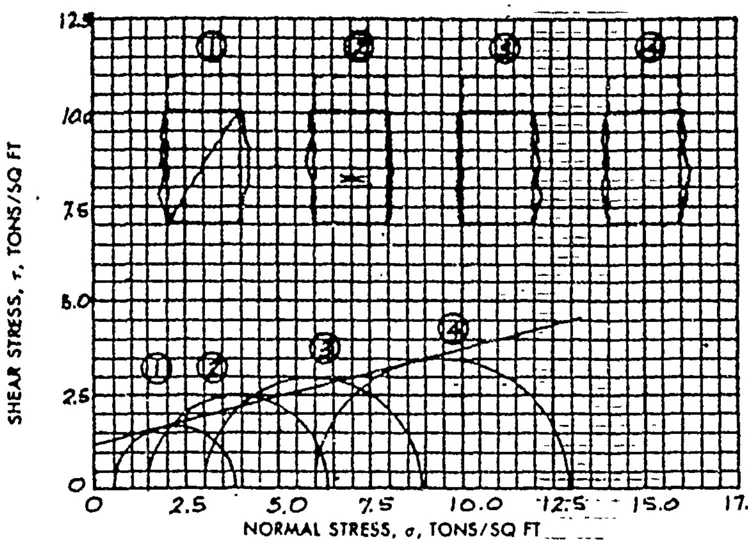
Depth 2.4 - 11.1 | Date FEB 66

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

(5P)





SHEAR VALUES

ϕ = 14.1

TAN ϕ = .251

c = 1.2 TONS/SQ FT

TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	14.7%	14.7%	14.7%	14.8%
	VOID RATIO	e_o	.480	.483	.478	.485
	SATURATION	S_o	82%	82%	83%	82%
	DRY DENSITY LB/CU FT	γ_d	113.1	112.9	113.2	112.7
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.88	6.28	8.87	12.93
MINOR PRINCIPAL STRESS TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			20	22	22	23
INITIAL DIAMETER, ~~CM~~ in			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~CM~~ in			3.0	3.0	3.0	3.0

TYPE TEST Q

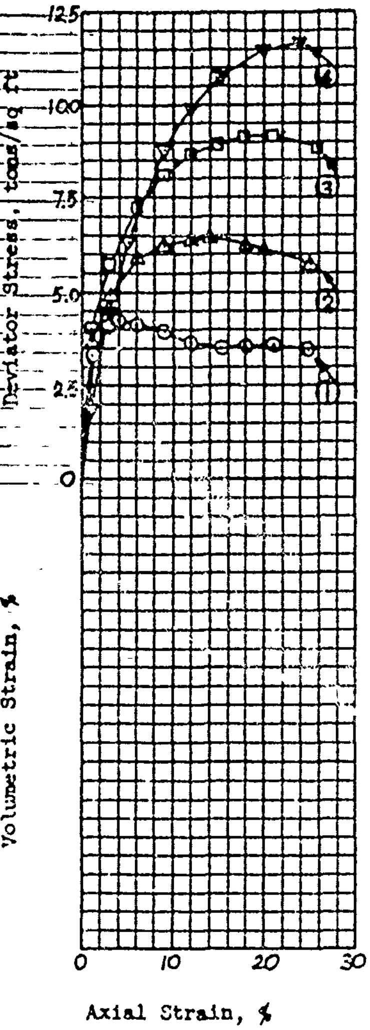
METHOD OF SATURATION ______ ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

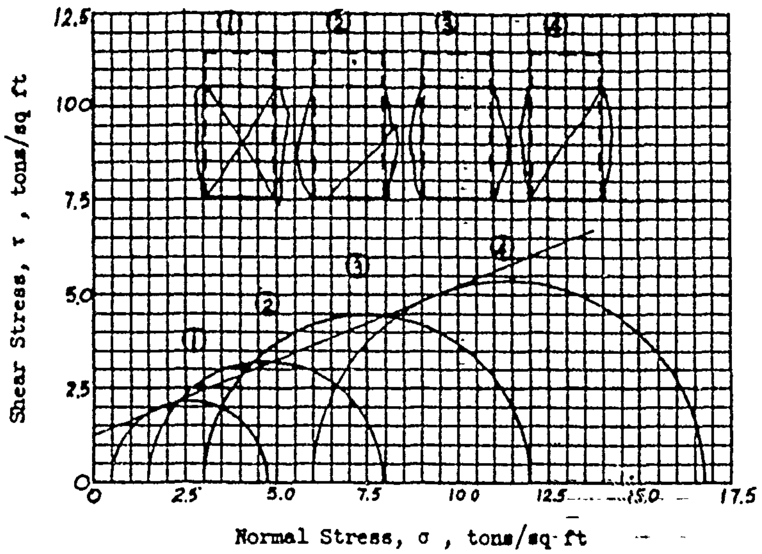
TYPE OF SPECIMEN Remolded	RATE OF STRAIN 0.02 IN/MIN		
CLASSIFICATION SAND, clayey (SC)			
LL 31	PL 13	PI 18	~~Gs~~ G = 2.68

REMARKS	PROJECT Dierks Dam
	AREA Borrow Material
	BORING NO. 10A-2C-169 / SAMPLE NO. (r,w) M-17,973
	DEPTH ~~ft~~ 1.0 - 3.3 / DATE Jul 68
	TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)
1 MAY 63

GPO 1964 OF—714-720





Shear Values

ϕ = 21.8 °

tan ϕ = .400

c = 1.2 tons/sq ft

Test No.			①	②	③	④
Initial	Water content	w_o	11.9 %	11.9 %	11.8 %	11.8 %
	Void ratio	e_o	.551	.564	.548	.561
	Saturation	S_o	58 %	57 %	58 %	56 %
	Dry density lb/cu ft	γ_d	107.8	107.1	108.1	107.1
Before Test	Water content	w_c	%	%	%	%
	Saturation	S_c	%	%	%	%
	Consolidation press., tons/sq ft	σ_c				
	Void ratio	e_c				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Major principal stress, tons/sq ft		σ_1	4.76	7.93	11.96	16.75
Minor principal stress, tons/sq ft		σ_3	0.5	1.5	3.0	6.0
Time to failure, min			7	21	23	24
Initial diameter, ~~cm~~ in			1.4	1.4	1.4	1.4
Initial height, H_o, ~~cm~~ in			3.0	3.0	3.0	3.0

Type Test Q

Method of Saturation ________ ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded Rate of strain 0.02 in./min

Classification SAND, Clayey (SC)

LL 31 | PL 13 | PI 18 | G_s = 2.68

Remarks Major principal stresses are based on max. deviator stresses at or below 15 % strain.

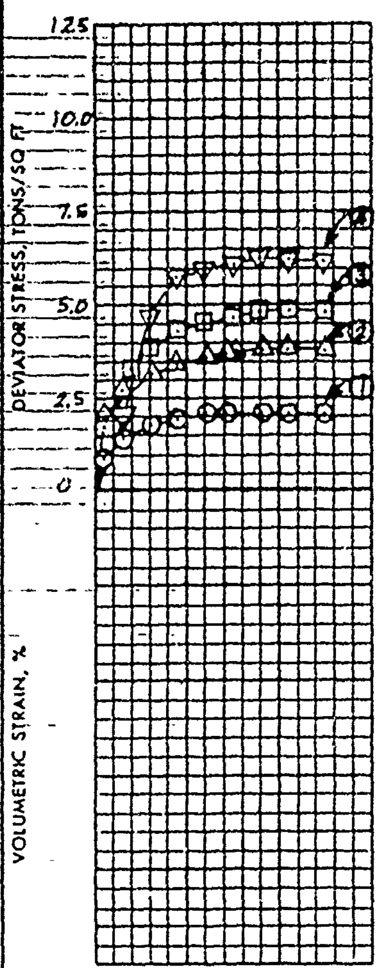
Project Dierks Dam

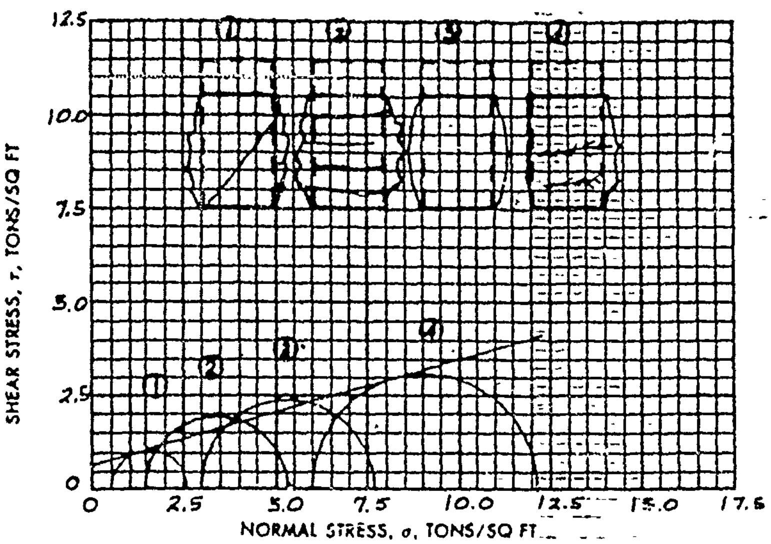
Area Borrow Material

Boring No. 10A-2C-169 Sample No. M-17,973 (95 %, w-3)

Depth ft 1.0 – 3.3 Date JUL 63

TRIAXIAL COMPRESSION TEST REPORT





SHEAR VALUES

ϕ = 15.8 °

TAN ϕ = .283

c = 0.6 TONS/SQ FT

TEST NO			①	②	③	④
INITIAL	WATER CONTENT	w_o	14.8 %	14.9 %	14.7 %	14.7 %
	VOID RATIO	e_o	.554	.562	.538	.561
	SATURATION	S_o	72 %	71 %	73 %	70 %
	DRY DENSITY LB/CU FT	γ_d	107.6	107.2	108.7	107.1
BEFORE TEST	WATER CONTENT	w_c	%	%	%	%
	SATURATION	S_c	%	%	%	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c				
	VOID RATIO	e_c				
FINAL	WATER CONTENT	w_f	%	%	%	%
	VOID RATIO	e_f				
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.55	5.30	7.69	12.17
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	0.5	1.5	3.0	6.0
TIME TO FAILURE, MIN			21	23	23	23
INITIAL DIAMETER, in			1.4	1.4	1.4	1.4
INITIAL HEIGHT, H_o, in			3.0	3.0	3.0	3.0

TYPE TEST Q
METHOD OF SATURATION

☐ CONTROLLED STRESS. ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.02 IN./MIN

CLASSIFICATION SAND, clayey (SC)

LL 31 | PL 13 | PI 18 | G = 2.68

REMARKS Major principal stresses are based on max. deviator stresses at or below 15 % strain.

PROJECT Dierks Dam

AREA Borrow Material

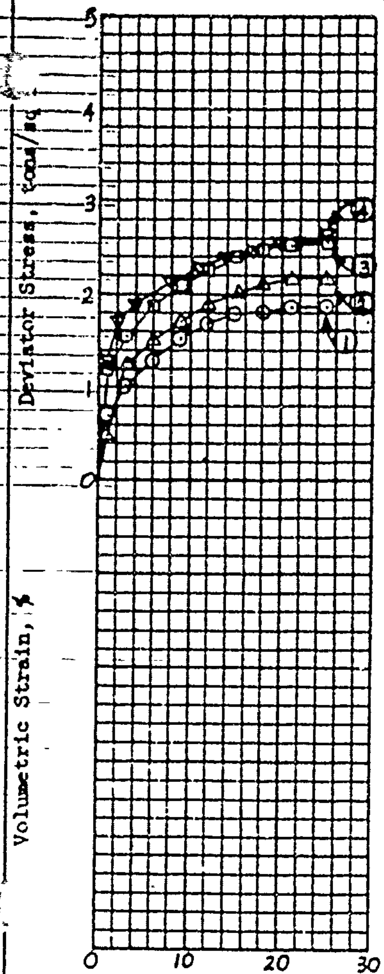
BORING NO. 10A-2C-169 SAMPLE NO. (96 T,W) M-17,973

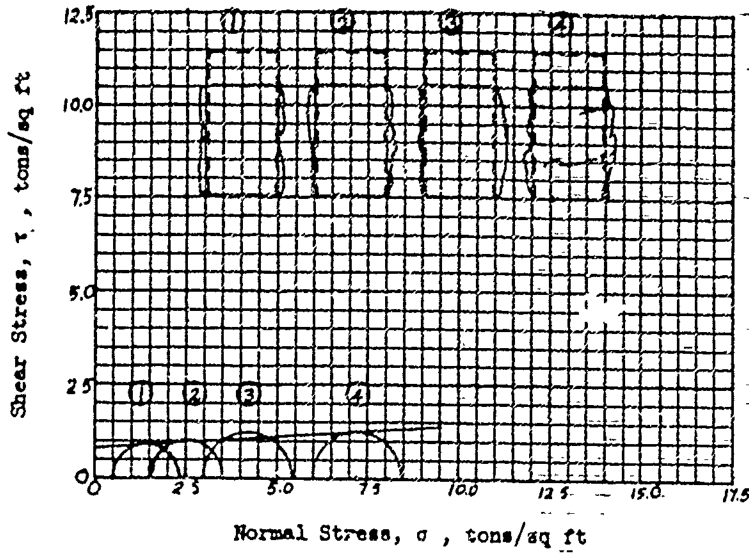
DEPTH ft 1.0 – 3.3 DATE JUL 6?

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

Plate No. 5





Shear Values

ø = 32 °

tan ø = .055

c = 0.8 tons/sq ft

Test No.			1	2	3	4
Initial	Water content	w_o	17.7 %	17.6 %	17.6 %	17.7 %
	Void ratio	e_o	.548	.551	.545	.559
	Saturation	S_o	87 %	86 %	87 %	85 %
	Dry density lb/cu ft	γ_d	108.1	107.8	108.4	107.4
Before Test	Water content	w_c	%	%	%	%
	Saturation	S_c	%	%	%	%
	Consolidation press., tons/sq ft	σ_c				
	Void ratio	e_c				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Major principal stress, tons/sq ft		σ_1	2.29	3.52	5.40	8.43
Minor principal stress, tons/sq ft		σ_3	0.5	1.5	3.0	6.0
Time to failure, min			24	23	23	25
Initial diameter, in			1.4	1.4	1.4	1.4
Initial height, H_o, in			3.0	3.0	3.0	3.0

Type Test Q

Method of Saturation ______ ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded Rate of strain 0.02 in./min

Classification SAND, Clayey (SC)

LL 31 | PL 13 | PI 18 | G = 2.68

Remarks Major principal stresses are based on max deviator stresses at or below 15% strain.

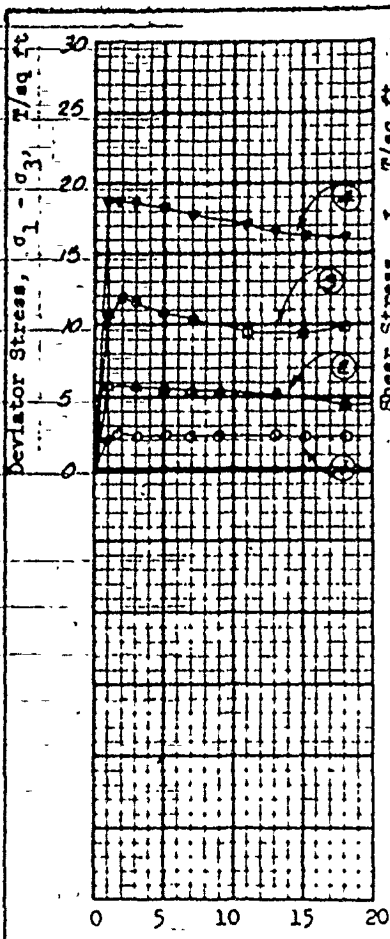
Project Dierks Dam

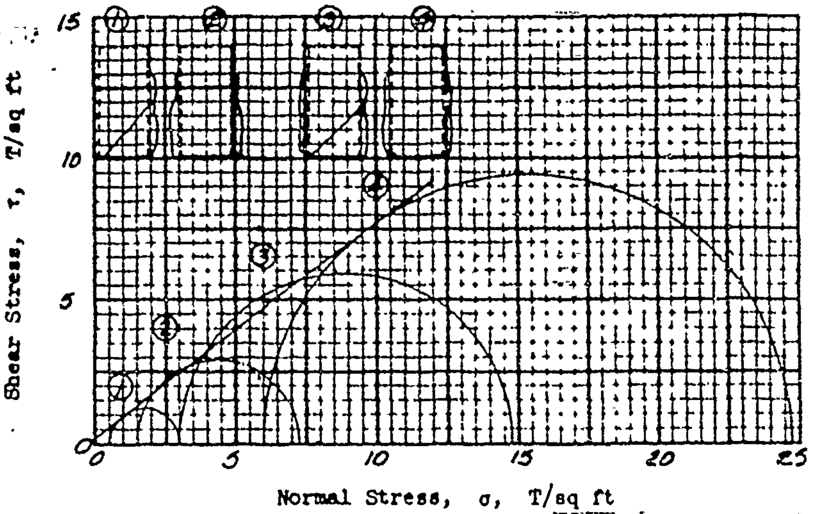
Area Borrow Material

Boring No. 10A-2C-169 Sample No. (95 T.w+3) M-17,973

Depth 1.0 - 3.3 Date JUL 66

TRIAXIAL COMPRESSION TEST REPORT





Test No.			①	②	③	④
Initial	Water content	w_o	10.1 %	10.2 %	10.2 %	10.1 %
	Void ratio	e_o	.416	.422	.407	.426
	Saturation	S_o	65 %	65 %	67 %	63 %
	Dry density, lb/cu ft	γ_d	117.7	117.2	118.5	116.9
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	2.50	5.82	11.83	18.78
Time to failure, min		t_f	3	4	6	4
Rate of strain, percent/min			0.6	0.4	0.3	0.4
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Shear Strength Parameters

ϕ = 36.6 °

tan ϕ = .743

c = 0.3 T/sq ft

Method of saturation ______

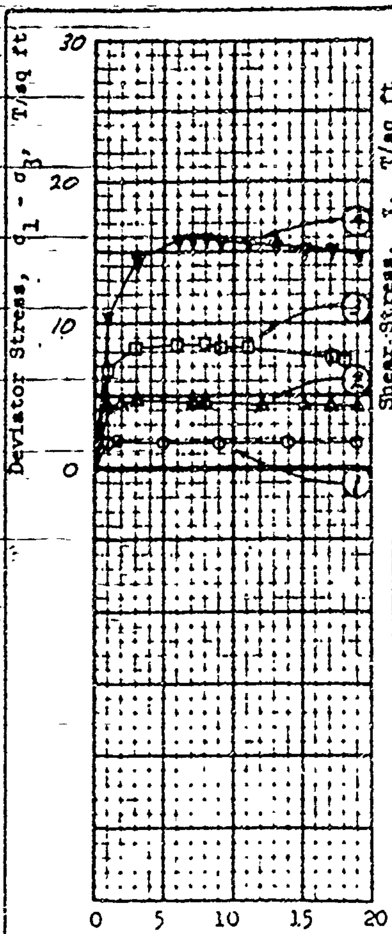
☐ Controlled stress

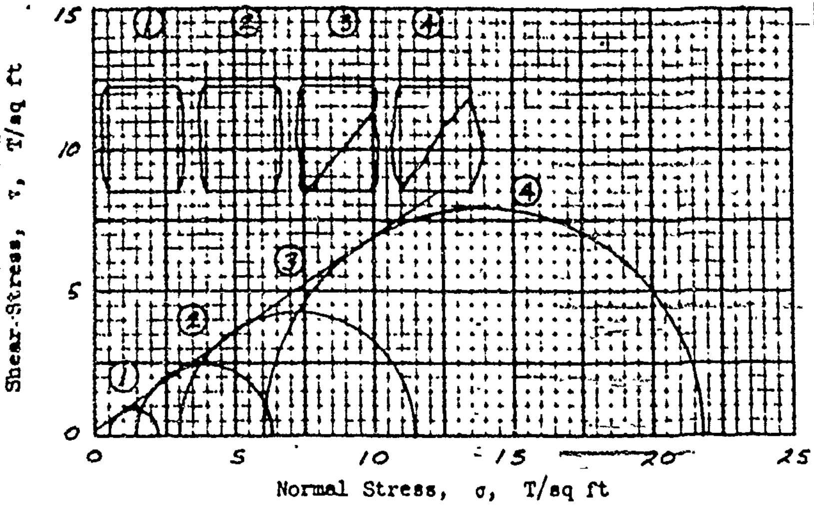
☑ Controlled strain

Type of test Q	Type of specimen Remolded			
Classification SAND, silty (SM)				
LL NP	PL NP	PI NP		G_s 2.67

Remarks

Project DIERKS DAM	
Area Borrow Material	
Boring No. TP-488	Sample No. (D.W.) M-18,548
Depth 0.0-8.0	Date OCT 66
TRIAXIAL COMPRESSION TEST REPORT	





Shear Strength Parameters

ϕ = 34.2°

tan ϕ = .680

c = .01 T/sq ft

Method of saturation

☐ Controlled stress

☑ Controlled strain

Test No.			①	②	③	④
Initial	Water content	w_o	10.2 %	10.2 %	10.3 %	10.0 %
	Void ratio	e_o	.491	.492	.491	.489
	Saturation	S_o	55 %	55 %	56 %	54 %
	Dry density, lb/cu ft	γ_d	111.8	111.7	111.8	111.9
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.79	4.81	8.45	15.89
Time to failure, min		t_f	6	5	9	11
Rate of strain, percent/min			0.3	0.6	0.7	0.6
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Type of test Q | Type of specimen Remolded

Classification SAND, silty (SM)

LL NP | PL NP | PI NP | G_s 2.67

Remarks

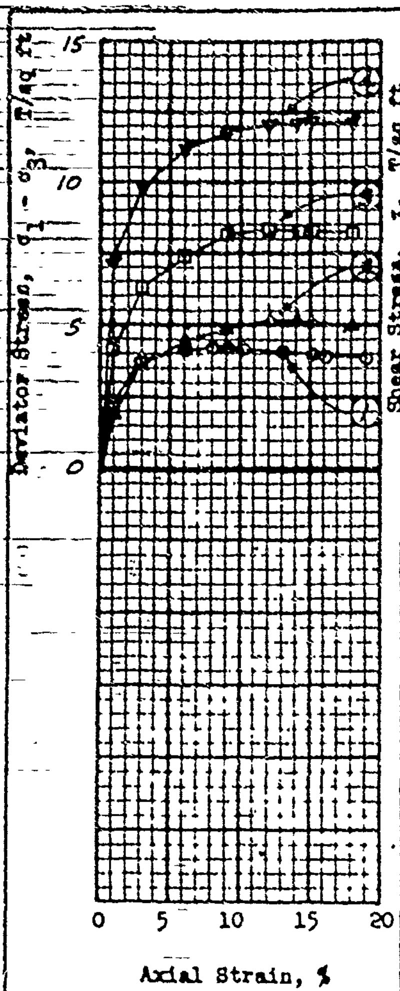
Project DIERKS DAM

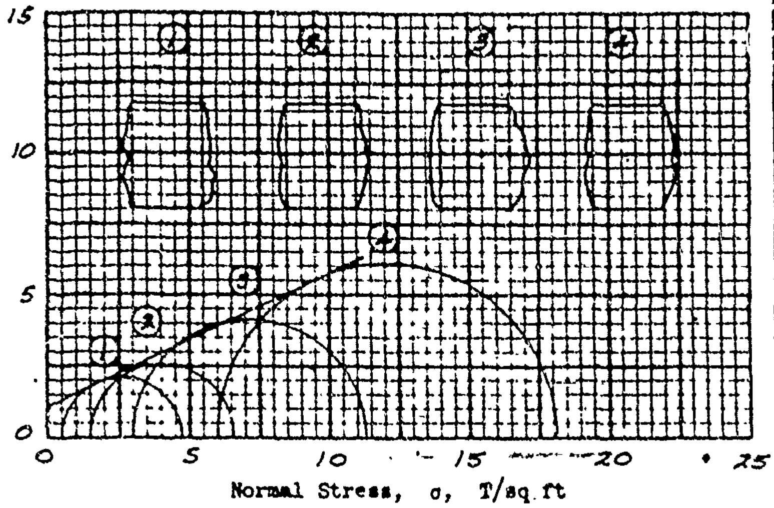
Area Borrow Material

Boring No. TP-488 | Sample No. M-18,548 (958,w)

Depth El 0.0-8.0 | Date Oct 88

TRIAXIAL COMPRESSION TEST REPORT





	Test No.		①	②	③	④
Initial	Water content	w_o	12.5 %	12.5 %	12.6 %	12.5 %
Initial	Void ratio	e_o	.419	.420	.425	.420
Initial	Saturation	S_o	80 %	80 %	80 %	80 %
Initial	Dry density, lb/cu ft	γ_d	118.4	118.2	117.9	118.3
Before Shear	Water content	w_c	%	%	%	%
Before Shear	Void ratio	e_c				
Before Shear	Saturation	S_c	%	%	%	%
Before Shear	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
Final	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	4.17	5.05	8.33	12.15
Time to failure, min		t_f	10	21	19	23
Rate of strain, percent/min			0.6	0.7	0.6	0.6
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Shear Strength Parameters

ϕ = 24.9°

tan ϕ = .464

c = .11 T/sq ft

Method of saturation ______

☐ Controlled stress

☑ Controlled strain

Type of test Q | Type of specimen Remolded

Classification CLAY, sandy (CL) — Composite of minus #10 fractions of SND Samples M-18,564, -18,565, and 18,567.

LL 25 | PL 12 | PI 13 | G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

Project DIERKS DAM

Area Borrow Materia

Boring No. TP-491/TP-493 | Sample No. M-18,564 C (T,W)

Depth El 2.0-10.1 | Date OCT 66

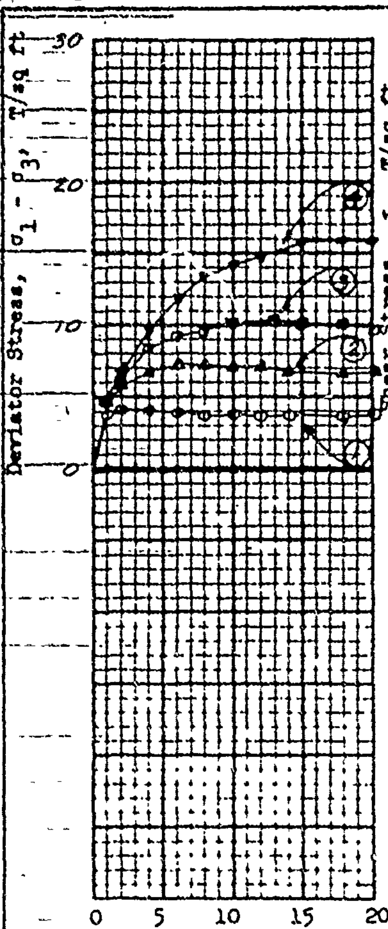
TRIAXIAL COMPRESSION TEST REPORT

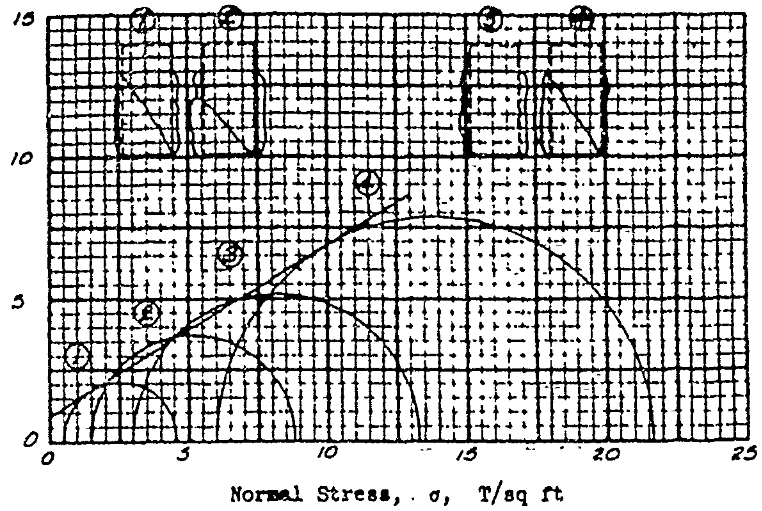
ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT

(65)

Plate No. 13





Shear Strength Parameters

ϕ = 30.9 °

tan ϕ = .599

c = 0.9 T/sq ft

Method of saturation ______

☐ Controlled stress

☑ Controlled strain

Test No.			①	②	③	④
Initial	Water content	w_o	9.6 %	9.6 %	9.8 %	9.7 %
	Void ratio	e_o	.488	.487	.486	.498
	Saturation	S_o	53 %	53 %	54 %	52 %
	Dry density, lb/cu ft	γ_d	112.9	113.0	113.0	112.0
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	4.05	7.27	10.34	15.65
Time to failure, min		t_f	4	13	21	25
Rate of strain, percent/min			0.5	0.6	0.6	0.6
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$		-		
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Type of test Q | Type of specimen Remolded

Classification CLAY, sandy (CL) — Composite of minus No. 10 fractions of SWD Samples M-18,564, -18,565, and -18,567.

LL 25 | PL 12 | PI 13 | G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

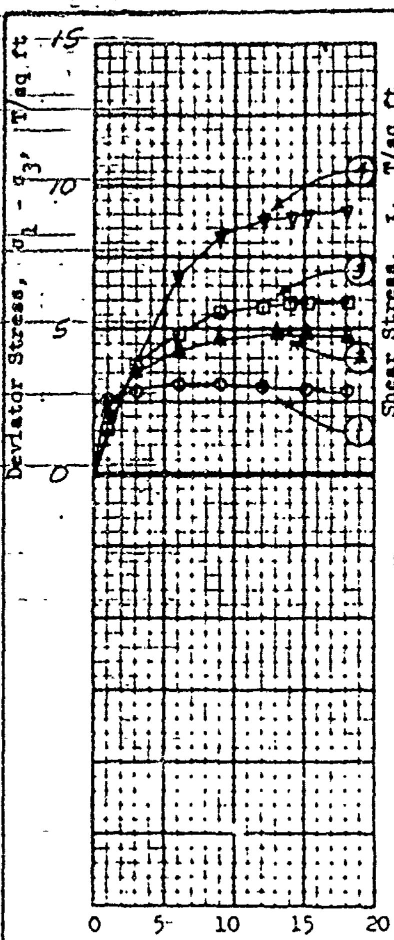
Project DIERKS DAM

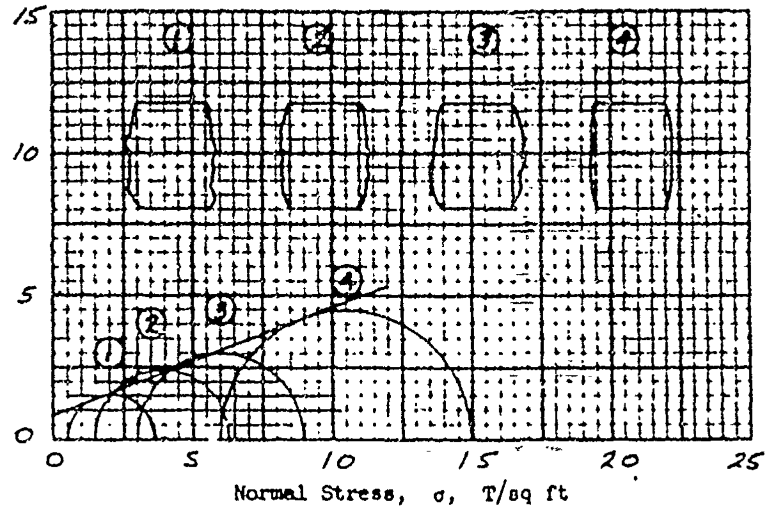
Area Borrow Material

Boring No. TP-491 & TP-492 | Sample No. (958, W-3) M-18,564-C

Depth [redacted] 2.0 - 10.1 | Date

TRIAXIAL COMPRESSION TEST REPORT





Shear Strength Parameters

ϕ = 204 °

tan ϕ = .372

c = 09 T/sq ft

Method of saturation ______

☐ Controlled stress

☑ Controlled strain

			Test No.	①	②	③	④
Initial	Water content	w_o		12.6 %	12.4 %	12.4 %	12.5 %
	Void ratio	e_o		.491	.493	.487	.498
	Saturation	S_o		69 %	68 %	69 %	68 %
	Dry density, lb/cu ft	γ_d		112.6	112.5	112.9	112.1
Before Shear	Water content	w_c		%	%	%	%
	Void ratio	e_c					
	Saturation	S_c		%	%	%	%
	Final back pressure, T/sq ft	u_o					
Final	Water content	w_f		%	%	%	%
	Void ratio	e_f					
Minor principal stress, T/sq ft		σ_3		0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$		3.10	4.81	5.90	8.97
Time to failure, min		t_f		14	21	22	18
Rate of strain, percent/min				0.6	0.6	0.6	0.8
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$					
Initial diameter, in.		D_o		1.4	1.4	1.4	1.4
Initial height, in.		H_o		3.0	3.0	3.0	3.0

Type of test Q | Type of specimen Remoldeu

Classification CLAY, sandy (CL) — Composite of minus No. 10 fractions of SWD Samples M-18,564, -18,565, and -18,567.

LL 25 | PL 12 | PI 13 | G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

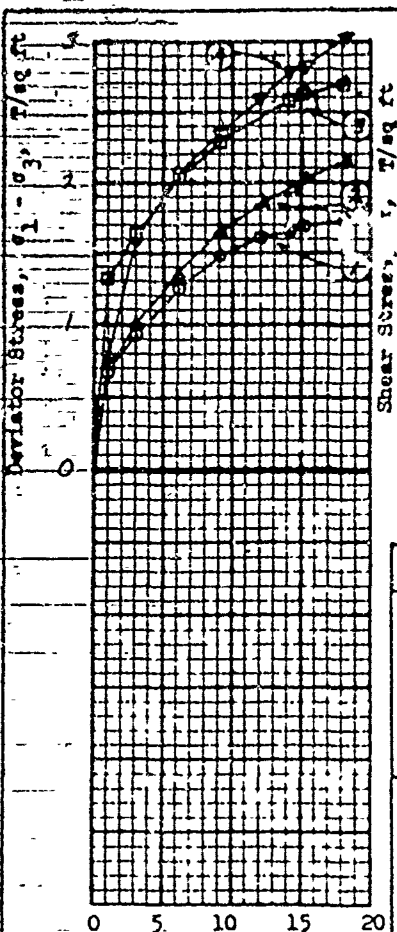
Project DIERKS DAM

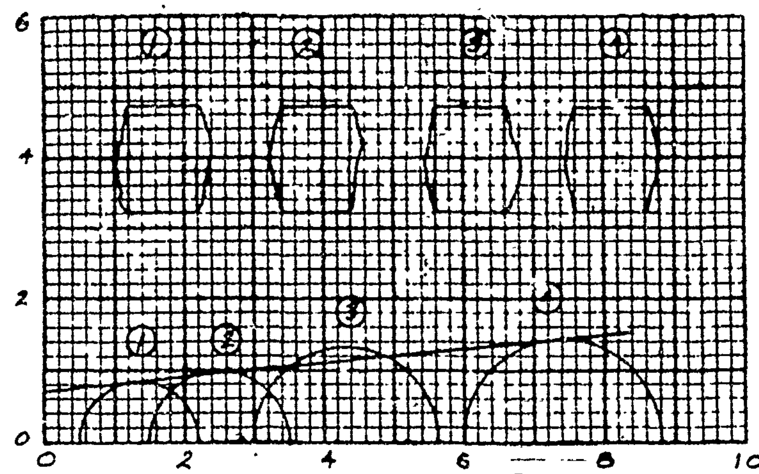
Area Borrow Material

Boring No. TP-491 & TP-493 Sample No. M-18,564-C (95%, w)

Depth/El. 2.0-10.1 Date OCT 66

TRIAXIAL COMPRESSION TEST REPORT





Test No.			①	②	③	④
Initial	Water content	w_o	15.6 %	15.4%	15.5%	15.5%
	Void ratio	e_o	.488	.487	.486	.490
	Saturation	S_o	86 %	85 %	86 %	85 %
	Dry density, lb/cu ft	γ_d	112.9	112.9	113.0	112.7
Before Shear	Water content	w_c	%	%	%	%
	Void ratio	e_c				
	Saturation	S_c	%	%	%	%
	Final back pressure, T/sq ft	u_o				
Final	Water content	w_f	%	%	%	%
	Void ratio	e_f				
Minor principal stress, T/sq ft		σ_3	0.5	1.5	3.0	6.0
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.68	2.01	2.62	2.82
Time to failure, min		t_f	24	21	23	22
Rate of strain, percent/min			0.6	0.7	0.6	0.7
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	1.4
Initial height, in.		H_o	3.0	3.0	3.0	3.0

Shear Strength Parameters

ϕ = 54 °

tan ϕ = .094

c = 0.7 T/sq ft

Method of saturation ____

☐ Controlled stress

☑ Controlled strain

Type of test Q | Type of specimen Remolded

Classification CLAY, sandy (CL) — Composite of minus No. 10 fractions of SWD Samples M-18,564, -18,565, and -18,567

LL 25 | PL 12 | PI 13 | G_s 2.69

Remarks *Major principal stresses are based on maximum deviator stresses at or below 15% strain.*

Project DIERKS DAM

Area Borrow Material

Boring No. TP-491 & TP-493 | Sample No. M-18,564 C (565, 567)

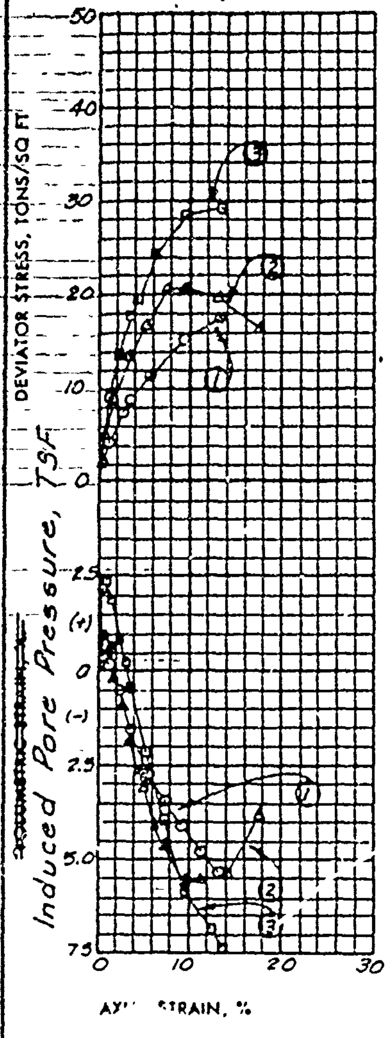
Depth, ft 2.0-10.1 | Date OCT 88

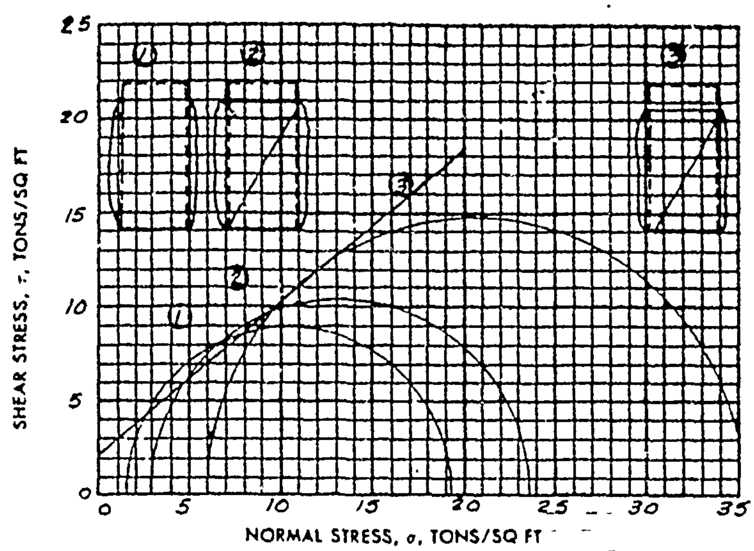
TRIAXIAL COMPRESSION TEST REPORT

APPENDIX E

COMPACTED MATERIALS

SECTION 2. R TRIAXIAL TESTS





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	11.7 %	11.8 %	11.9 %	%
	VOID RATIO	e_o	.435	.430	.438	
	SATURATION	S_o	72 %	73 %	73 %	%
	DRY DENSITY LB/CU FT	γ_d	116.2	116.6	115.8	
BEFORE TEST	WATER CONTENT	w_c	16.4 %	16.7 %	16.6 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c	1.45	2.95	6.00	
	VOID RATIO	e_c	.439	.445	.444	
FINAL	WATER CONTENT	w_f	16.4 %	16.7 %	16.6 %	%
	VOID RATIO At Failure	e_f	.439	.445	.444	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	19.26	23.59	35.33	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.45	2.95	6.00	
TIME TO FAILURE, MIN			435	265	460	
INITIAL DIAMETER, IN.			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, IN.			3.0	3.0	3.0	

AR VALUES

ϕ = 38.6

TAN ϕ = .796

c = 2.2 TONS/SQ FT

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.001 (Nominal) IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 PL 15 PI 6 G 2.67

REMARKS

PROJECT Dierks Dam

AREA

BORING NO 8A-200 SAMPLE NO. (δ, W) M-12,496

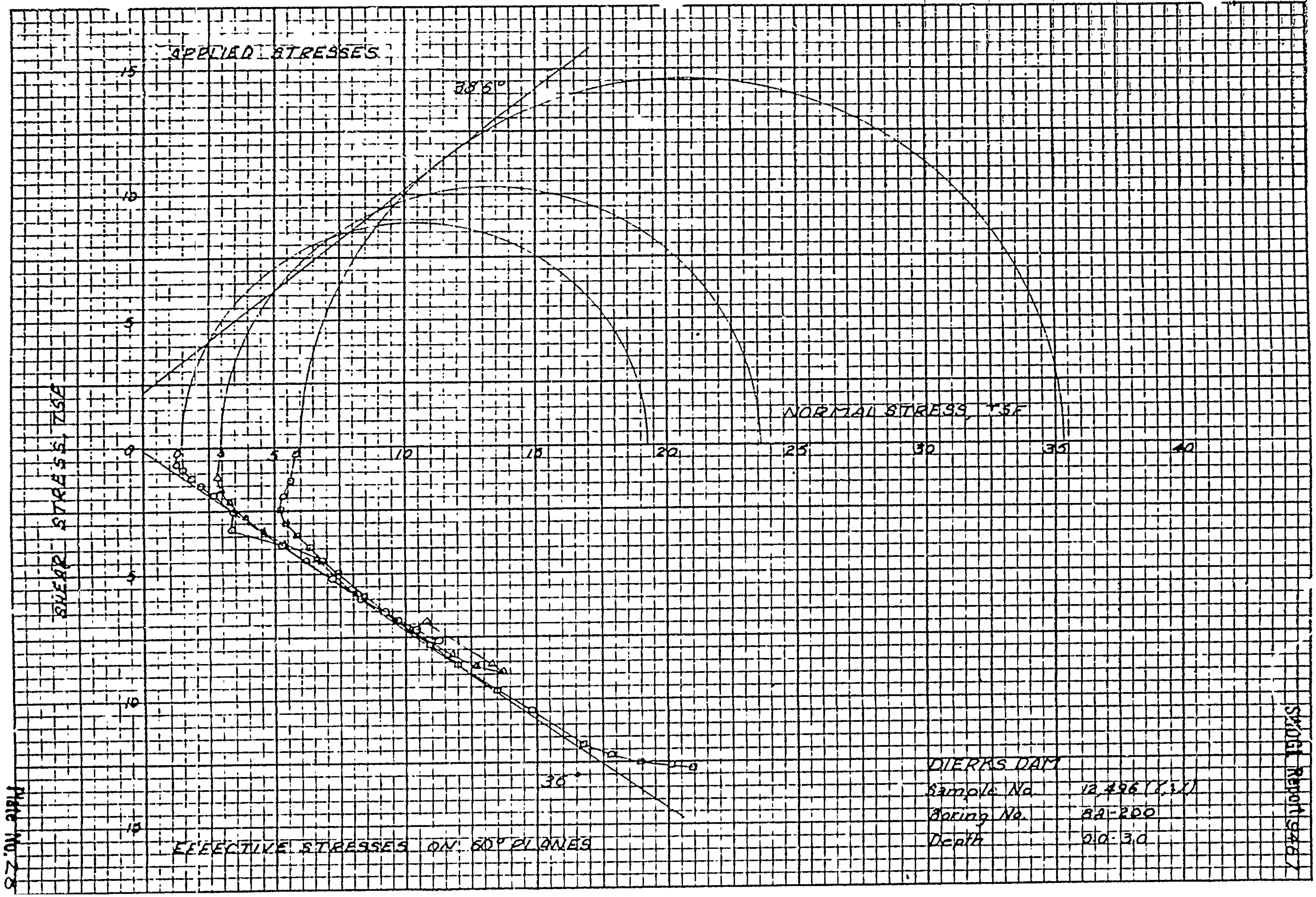
DEPTH 0.0-3.0 DATE NOV 85

TRIAXIAL COMPPESSION TEST REPORT

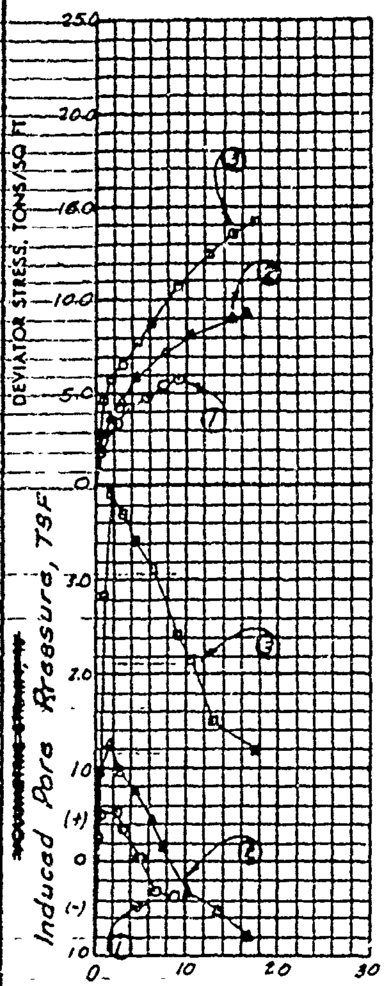
ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

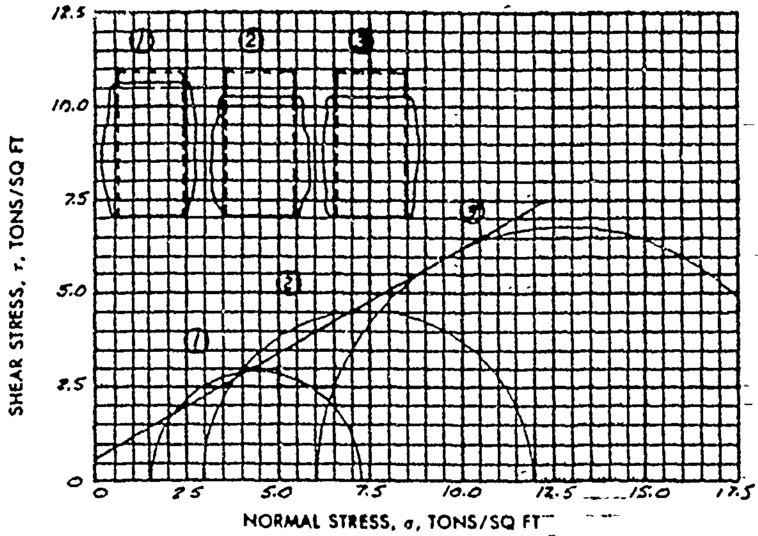
GPO 1964 OF—714-728

Plate No. 2



APPLIED STRESSES
38.5°
NORMAL STRESS, TSF
SHEAR STRESS, TSF
36°
EFFECTIVE STRESSES ON 60° PLANES
0
5
10
15
20
25
30
35
40
DIERKS DAM
Sample No. 12,496 (Z.1)
Boring No. 88-200
Depth 0.0-3.0





SHEAR VALUES

ϕ 29.0

TAN ϕ = .554

c = 0.6 TONS/SQ FT

	TEST NO		①	②	③	
INITIAL	WATER CONTENT	w_o	15.0 %	15.1 %	15.1 %	%
	VOID RATIO	e_o	.505	.499	.492	
	SATURATION	S_o	79 %	81 %	82 %	%
	DRY DENSITY LB/CU FT	γ_d	110.8	111.2	111.7	
BEFORE TEST	WATER CONTENT	w_c	19.7 %	17.6 %	16.7 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.55	2.95	6.05	
	VOID RATIO	e_c	.527	.471	.447	
FINAL	WATER CONTENT	w_f	19.7 %	17.6 %	16.7 %	%
	VOID RATIO At Failure	e_f	.527	.471	.447	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	7.28	11.95*	19.59*	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.55	2.95	6.05	
TIME TO FAILURE MIN			440	415*	390*	
INITIAL DIAMETER IN.			1.4	1.4	1.4	
INITIAL HEIGHT H_o, IN.			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remarks IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 PL 15 PI 6 G 2.67

REMARKS *At 15% strain
Rate of strain
Test #1, 0.0005 in/min
Test #2 & 3, 0.001 in/min

PROJECT Dierks Dam

AREA

BORING NO. 8A-200 SAMPLE NO. (958, W+4) M-12,496

DEPTH 0.0 - 3.0 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

GPO 1964 OF—714-719

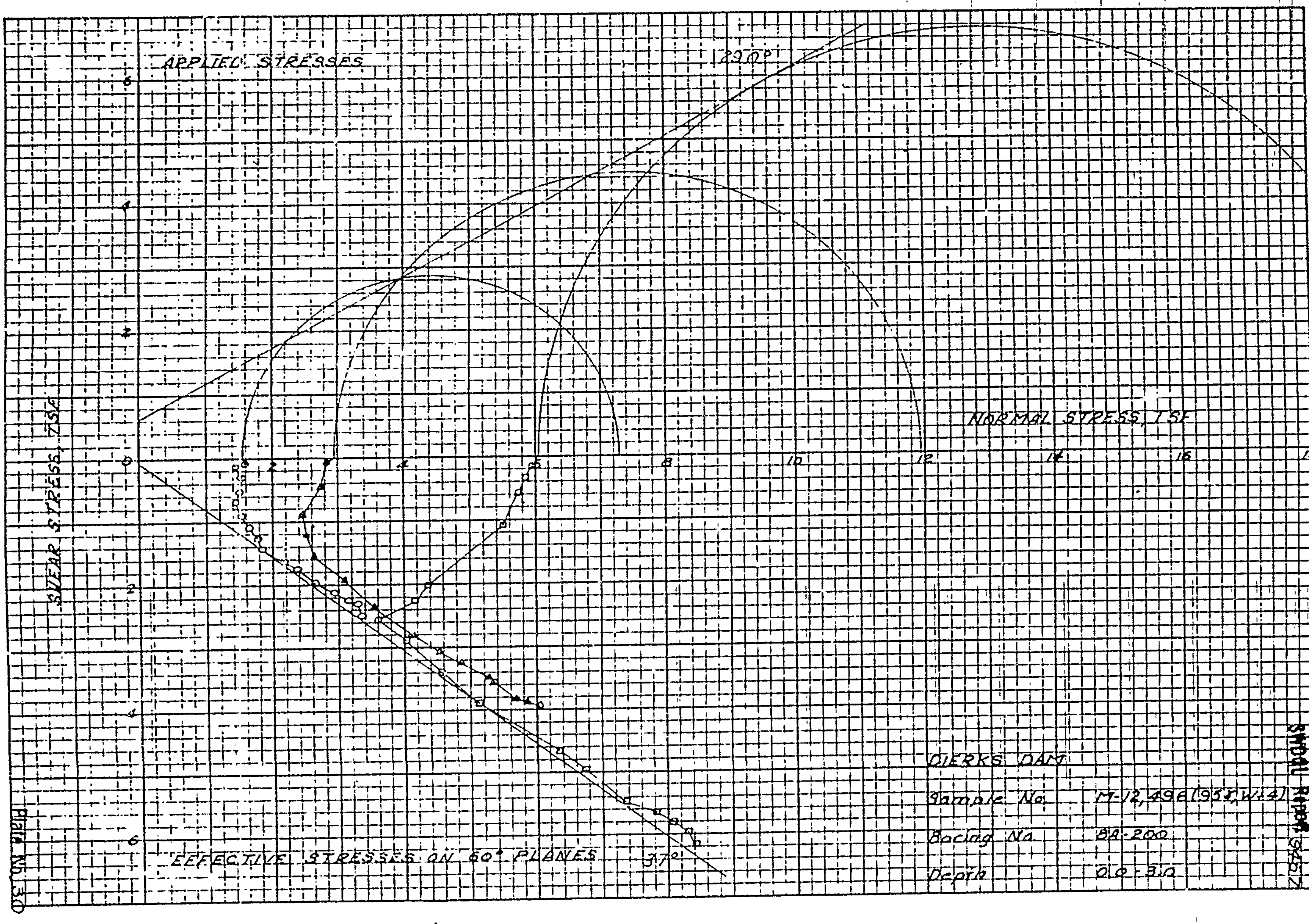
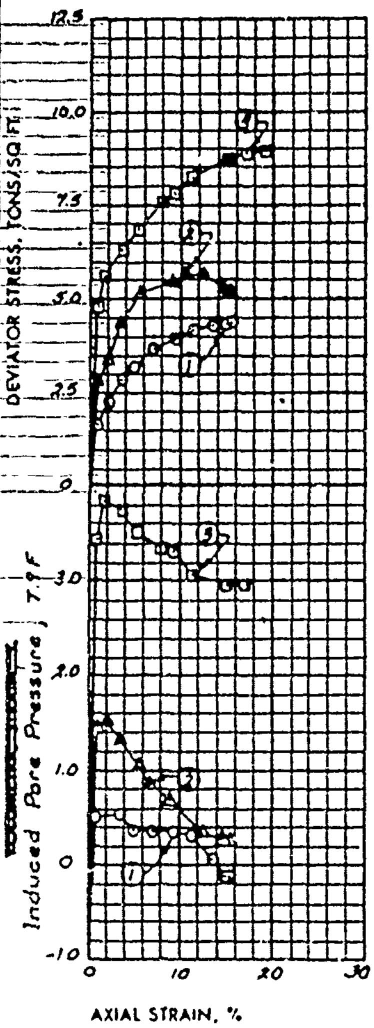
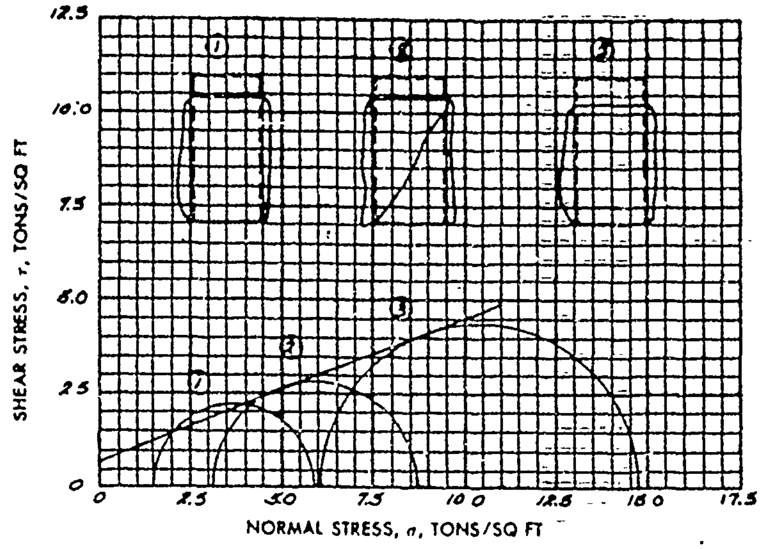

APPLIED STRESSES
29.0°
NORMAL STRESS, TSF
SHEAR STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
37°
DIERKS DAM
Sample No. M-12,496(95I,W-14)
Boring No. BA-200
Depth 0.0-3.0
SWDGL Report 9457

Plate No. 30





SHEAR VALUES

φ = 20.8

TAN φ = .380

c = 0.7 TONS/SQ FT

TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	11.6 %	11.8 %	11.8 %	%
	VOID RATIO	e_o	.504	.498	.512	
	SATURATION	S_o	61 %	63 %	62 %	%
	DRY DENSITY LB/CU FT	γ_d	110.8	111.4	110.3	
BEFORE TEST	WATER CONTENT	w_c	18.6 %	19.5 %	18.4 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c	1.50	3.15	6.05	
	VOID RATIO	e_c	.496	.520	.492	
FINAL	WATER CONTENT	w_f	18.6 %	19.5 %	18.4 %	%
	VOID RATIO (At Failure)	e_f	.496	.520	.492	
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	5.89 #	8.70	14.77 #	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.15	6.05	
TIME TO FAILURE, MIN			415 #	300	360 #	
INITIAL DIAMETER IN			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, IN			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back Pressure ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.001 IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 | PL 15 | PI 6 | G_s 2.67

REMARKS # At 15 % Strain

PROJECT Duerks Dam

AREA Borrow Material

BORING NO BA-200 SAMPLE NO (95I, W) M-12,496

DEPTH 0.0-3.0 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089, PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

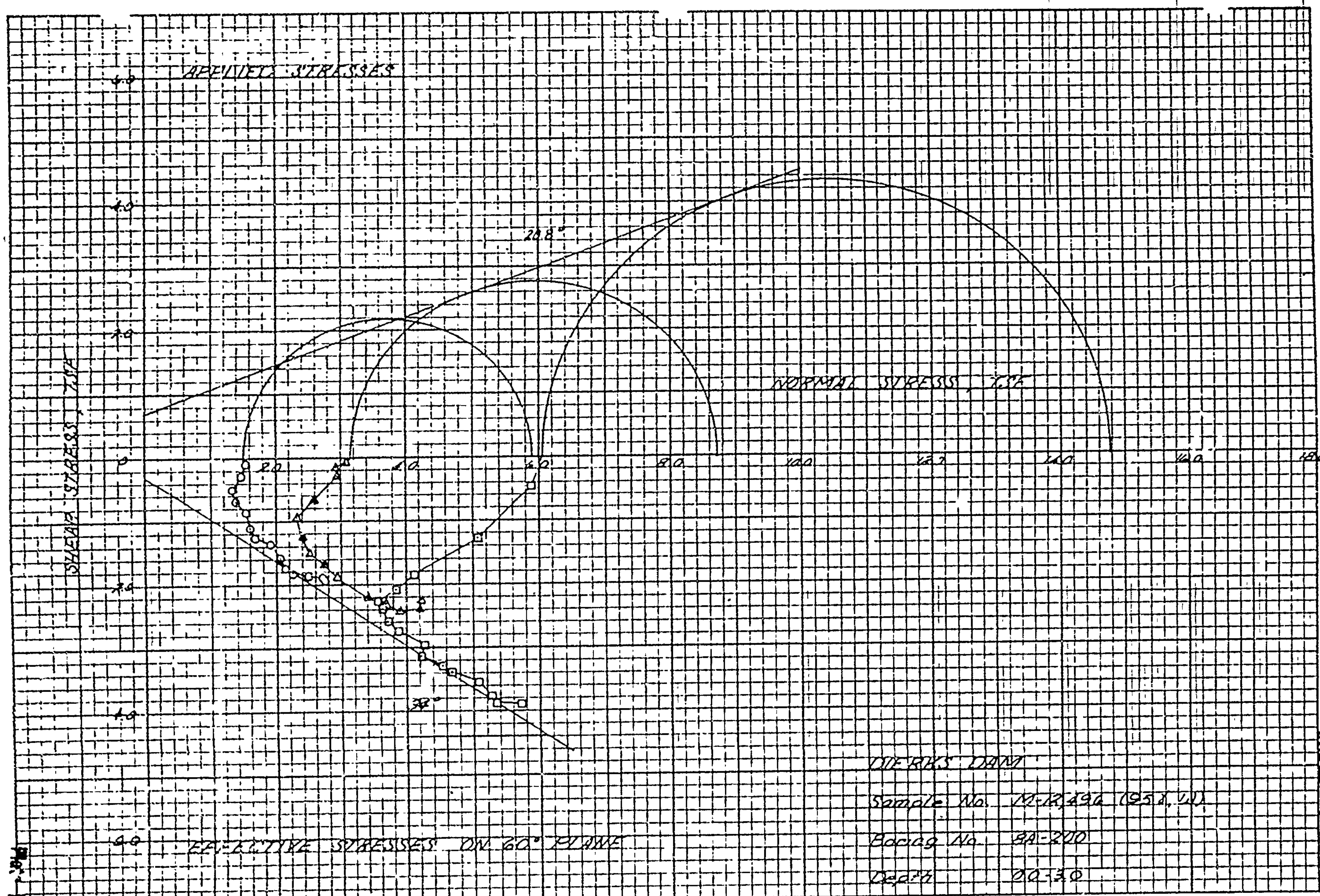
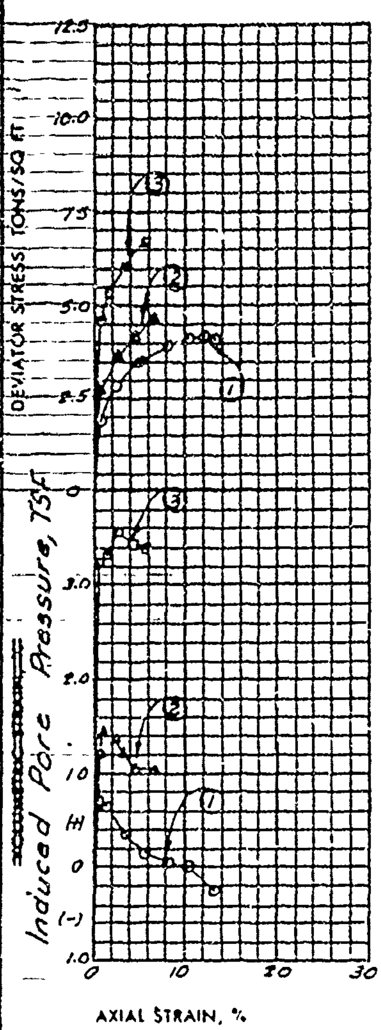
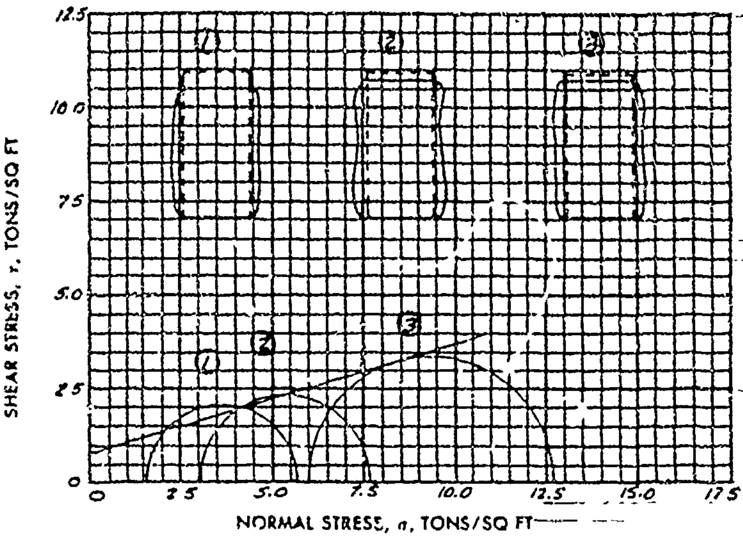

APPLIED STRESSES
EFFECTIVE STRESSES ON 60° PLANE
NORMAL STRESS, TSF
SHEAR STRESS, TSF
20.8°
32°
0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
OTERKS DAM
Sample No. M-12,494 (95 A, U)
Boring No. BA-200
Depth 00-30

Plate M. 3





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	9.2 %	9.0 %	9.1 %	%
	VOID RATIO	e_o	.532	.505	.509	
	SATURATION	S_o	46 %	48 %	48 %	%
	DRY DENSITY LB/CU FT	γ_d	108.8	110.7	110.5	
BEFORE TEST	WATER CONTENT	w_c	19.0 %	21.5 %	20.5 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.60	3.05	6.00	
	VOID RATIO	e_c	.507	.574	.549	
FINAL	WATER CONTENT	w_f	19.0 %	21.5 %	20.5 %	%
	VOID RATIO At Failure	e_f	.507	.574	.549	
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	5.72	7.62	12.73	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.60	3.05	6.00	
TIME TO FAILURE, MIN			415	460	415	
INITIAL DIAMETER IN.			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, IN.			3.0	3.0	3.0	

SHEAR VALUES

ϕ = 16.0

TAN ϕ = .286

c = 0.8 TONS/SQ FT

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remarks IN/MIN

CLASSIFICATION CLAY, sandy (CL-ML)

LL 21 | PL 15 | PI 6 | G_s 2.67

REMARKS
Rate of strain.
Test # 1, 0.001 in./min.
Test # 2 & 3, 0.0005 in./min.

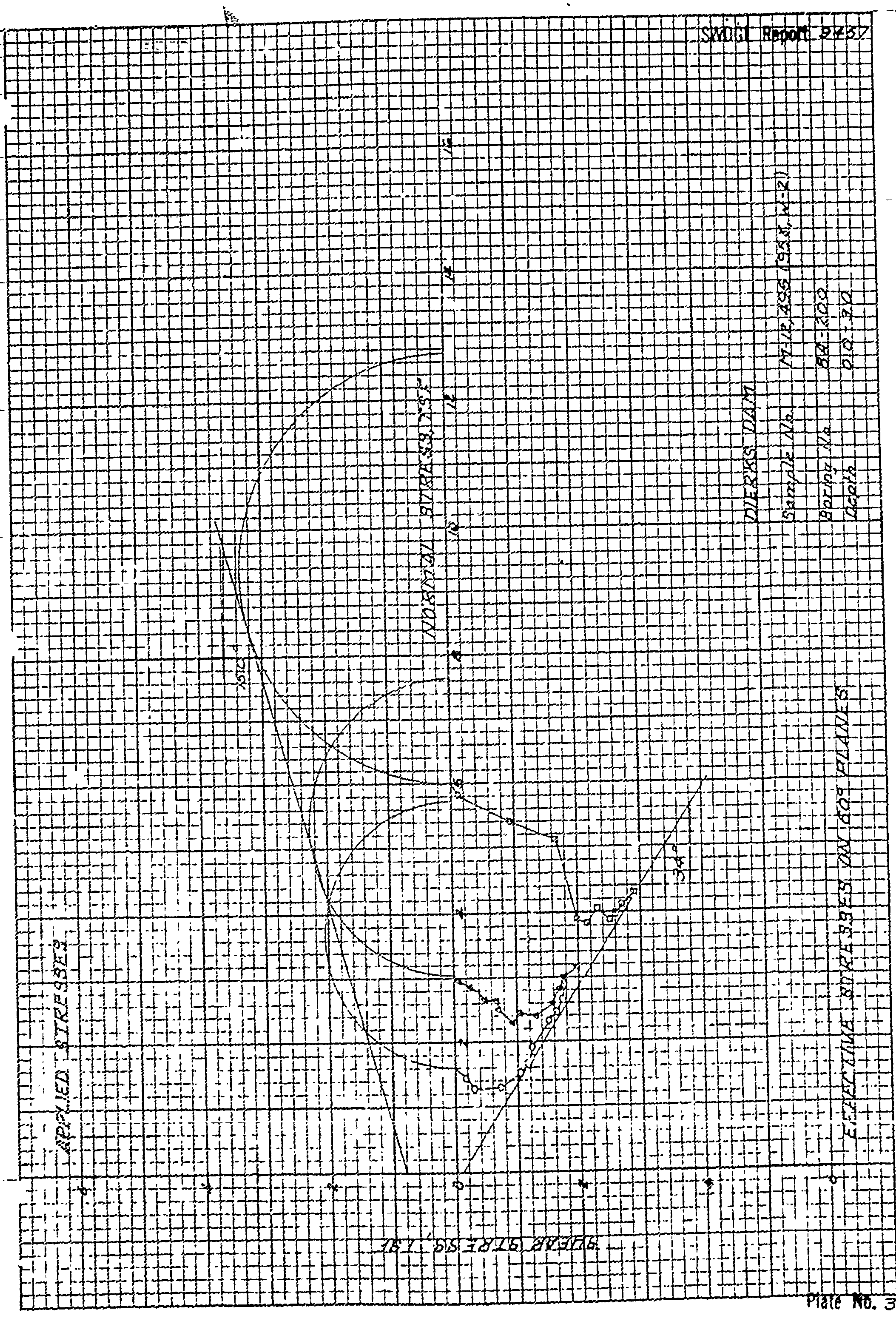
PROJECT Dierks Dam

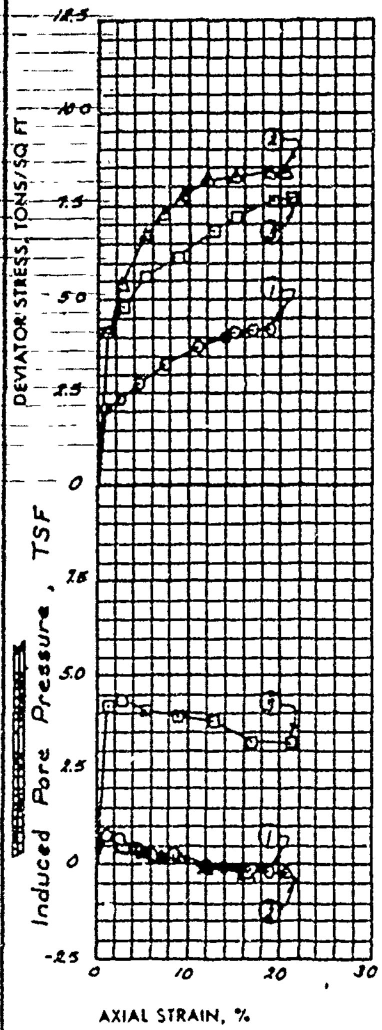
AREA

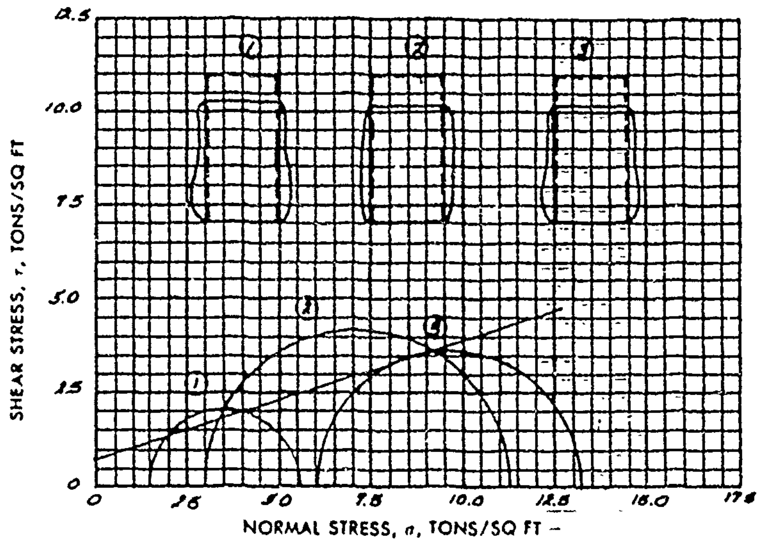
BORING NO BA-200 SAMPLE NO. (958, W-2) M-12,496

DEPTH 0.0 - 3.0 DATE NOV 6?

TRIAXIAL COMPRESSION TEST REPORT


DIERKS DAM
Sample No. M-12, 495 (95X, W-21)
Boring No. BA-302
Depth 010.30
NORMAL STRESS, TSF
SHEAR STRESS, TSF
APPLIED STRESSES
EFFECTIVE STRESSES ON 60° PLANES
34°





SHEAR VALUES

ø = 17.2

TAN ø = .310

c = 0.8 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	12.8 %	12.9 %	12.9 %	%
	VOID RATIO	e_o	.448	.436	.453	
	SATURATION	S_o	77 %	80 %	77 %	%
	DRY DENSITY LB/CU FT	γ_d	116.0	117.0	115.6	
BEFORE TEST	WATER CONTENT	w_c	17.1 %	15.8 %	15.6 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.50	3.00	6.05	
	VOID RATIO	e_c	.461	.426	.420	
FINAL	WATER CONTENT	w_f	17.1 %	15.8 %	15.6 %	%
	VOID RATIO	e_f	.461	.426	.420	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	5.57 *	11.31 *	13.20 *	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.00	6.05	
TIME TO FAILURE, MIN			355 *	330 *	330 *	
INITIAL DIAMETER, ~~CM~~ IN			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, ~~CM~~ IN			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back Pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.001 IN/MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 G_s 2.69

REMARKS * At 15 % Strain

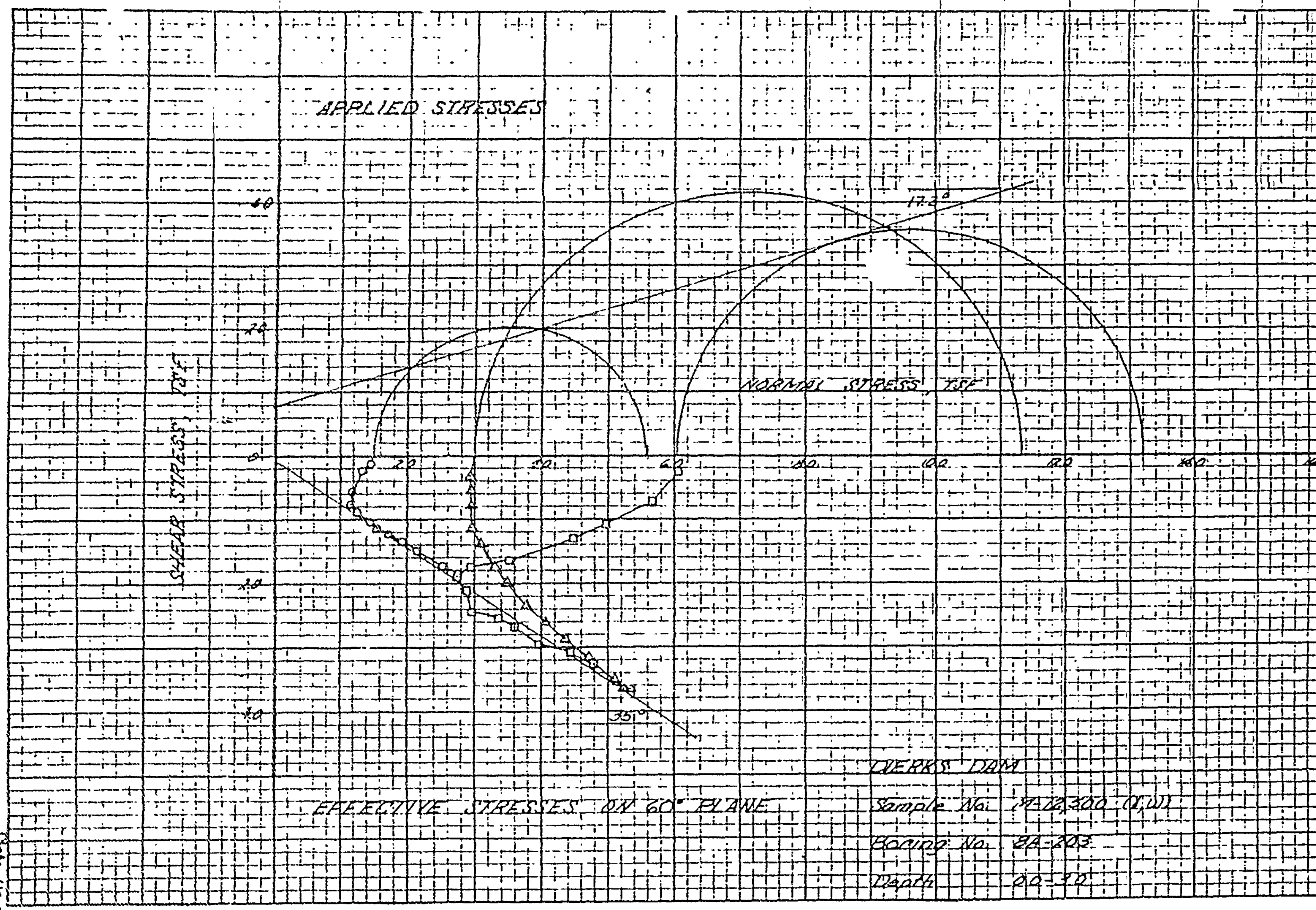
PROJECT Dierks Dam

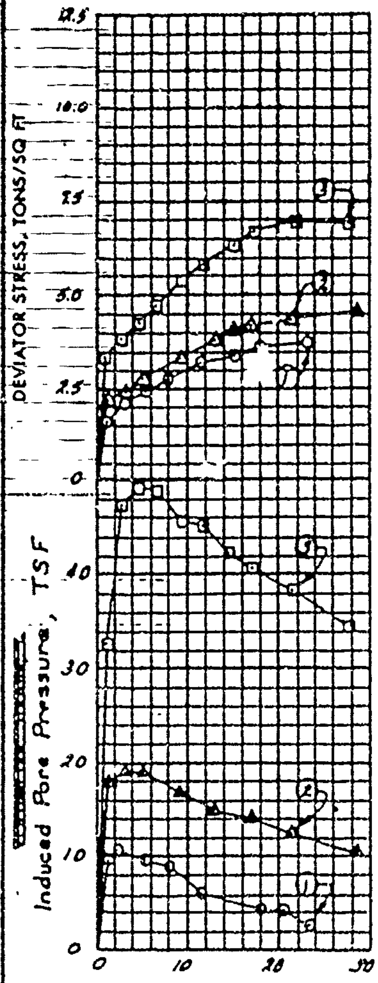
AREA

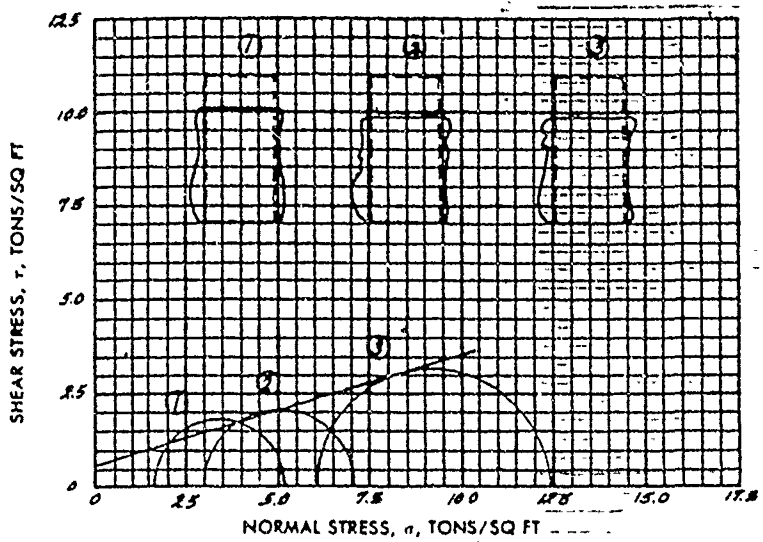
BORING NO 8A-203 SAMPLE NO. (T, W) M-12,500

DEPTH ft 0.0-3.0 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT


APPLIED STRESSES
17.2°
NORMAL STRESS, TSF
SHEAR STRESS, TSF
0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
33.1°
EFFECTIVE STRESSES ON 60° PLANE
DIERKS DAM
Sample No.
Boring No.
Depth 20-30





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	16.1 %	16.1 %	16.0 %	%
	VOID RATIO	e_o	.515	.512	.515	
	SATURATION	S_o	84 %	85 %	83 %	%
	DRY DENSITY LB/CU FT	γ_d	110.9	111.0	110.8	
BEFORE TEST	WATER CONTENT	w_c	17.4 %	16.9 %	15.9 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.70	3.00	6.05	
	VOID RATIO	e_c	.467	.454	.428	
FINAL	WATER CONTENT	w_f	17.4 %	16.9 %	15.9 %	%
	VOID RATIO	e_f	.467	.454	.428	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	5.16*	7.02*	12.42*	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.70	3.00	6.05	
TIME TO FAILURE, MIN			220*	170*	210*	
INITIAL DIAMETER ~~CM~~ IN			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, ~~CM~~ IN			3.0	3.0	3.0	

SHEAR VALUES

ϕ = 16.7°

TAN ϕ = .300

c = 0.6 TONS/SQ FT

TYPE TEST R
METHOD OF SATURATION Back Pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.002 IN/MIN

CLASSIFICATION CLAY (CL)

LL 30 | PL 14 | PI 16 | G_s 2.69

REMARKS *At 15% Strain

PROJECT Diecks Dam

AREA

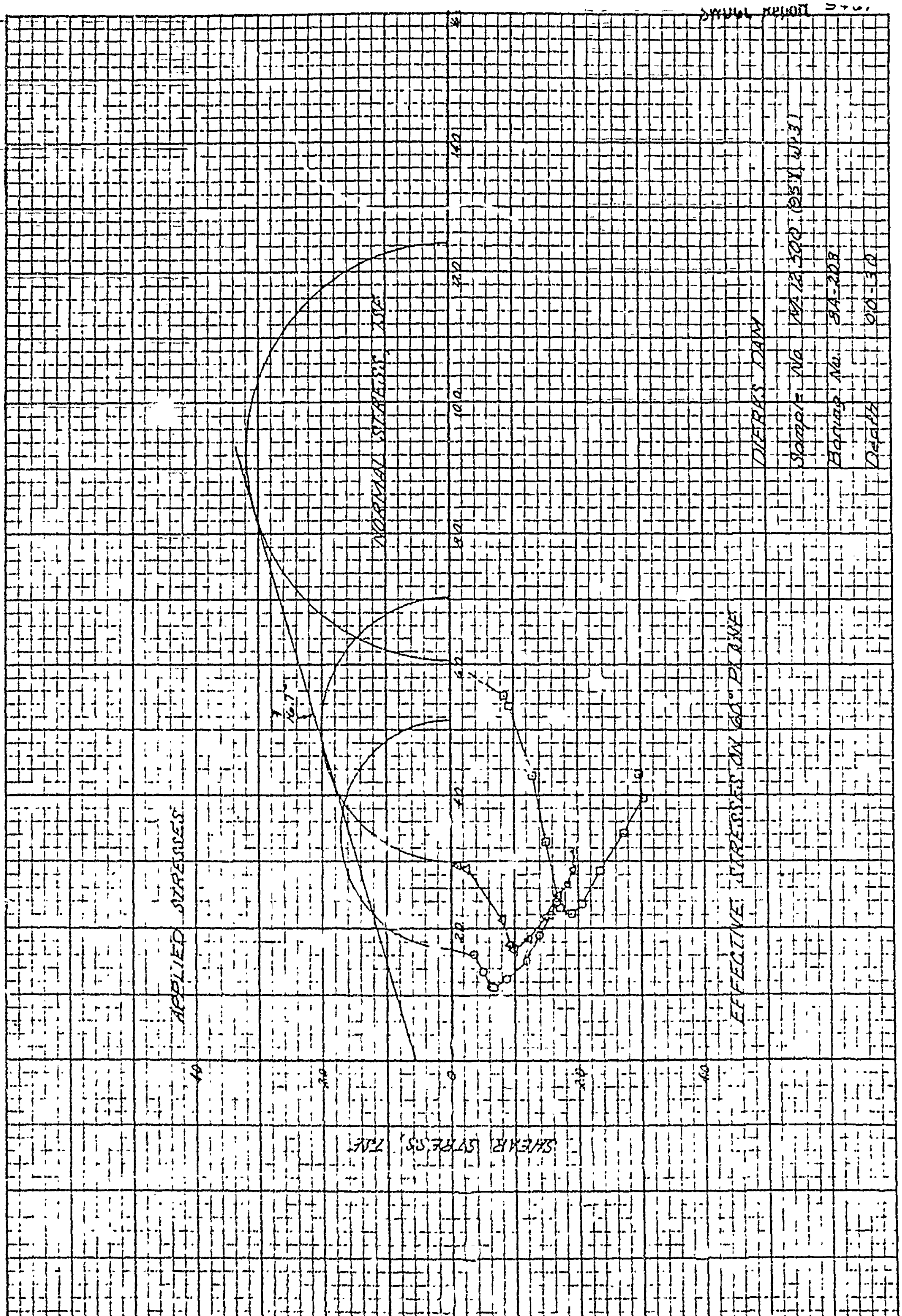
BORING NO 8A-203 SAMPLE NO. (951, W+3) M-12,500

DEPTH 0.0-3.0 DATE NOV 85

TRIAXIAL COMPRESSION TEST REPORT

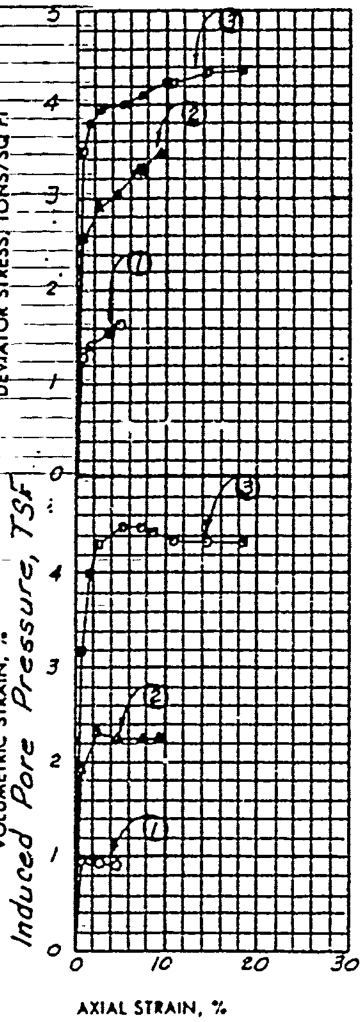
ENG FORM 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)
1 MAY 63

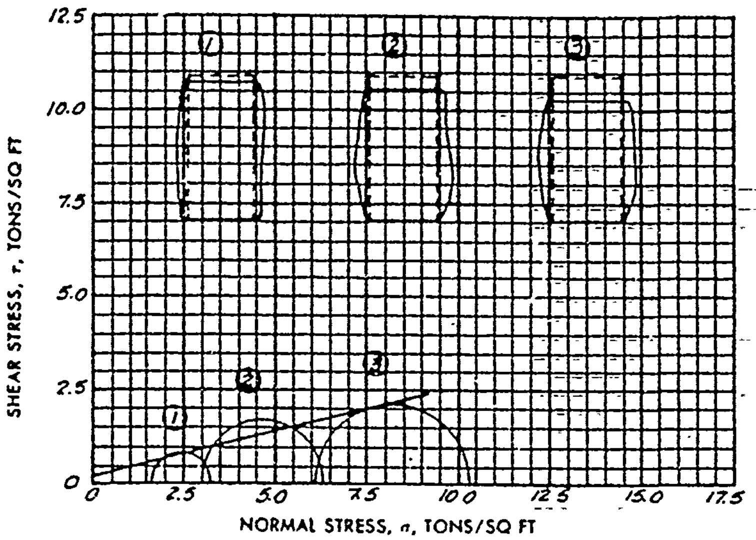
GPO 1964 OF-714-789



DIERKS DAM
Boring No. 8A-203
EFFECTIVE STRESSES ON 60° PLANE
APPLIED STRESSES
NORMAL STRESS, KSF
SHEAR STRESS
16.7°

Plate No. 38





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	13.2 %	12.7 %	13.1 %	%
	VOID RATIO	e_o	.518	.506	.519	
	SATURATION	S_o	69 %	68 %	68 %	%
	DRY DENSITY LB/CU FT	γ_d	110.6	111.5	110.6	
BEFORE TEST	WATER CONTENT	w_c	21.4 %	18.5 %	18.8 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.65	3.00	6.10	
	VOID RATIO	e_c	.575	.497	.505	
FINAL	WATER CONTENT	w_f	21.4 %	18.5 %	18.8 %	%
	VOID RATIO At Failure	e_f	.576	.497	.505	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.23	6.30	10.35	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.65	3.00	6.10	
TIME TO FAILURE, MIN			355	335	245	
INITIAL DIAMETER, IN.			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, IN.			3.0	3.0	3.0	

SHEAR VALUES

ϕ = 13.5

TAN ϕ = .240

c = 0.2 TONS/SQ FT

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remarks IN./MIN

CLASSIFICATION CLAY (CL)

LL 30 | PL 14 | PI 16 | G_s 2.69

REMARKS

Rate of strain:

Test #1 0.0003 in/min

Test #2 0.0005 in./min

Test #3 0.001 in./min

PROJECT Dierks Dam

AREA

BORING NO. BA-203

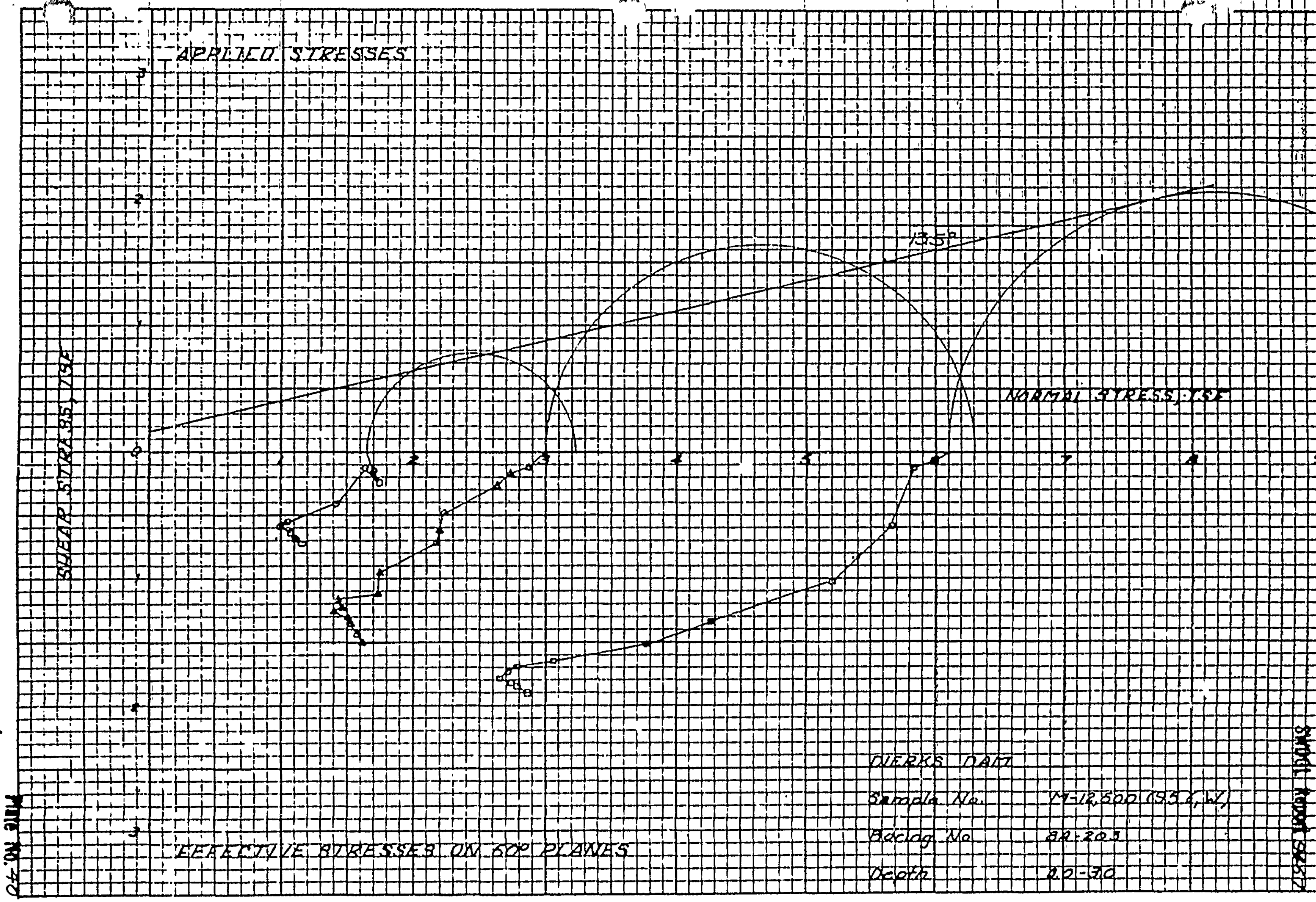
SAMPLE NO. (95 8,W) M-12,500

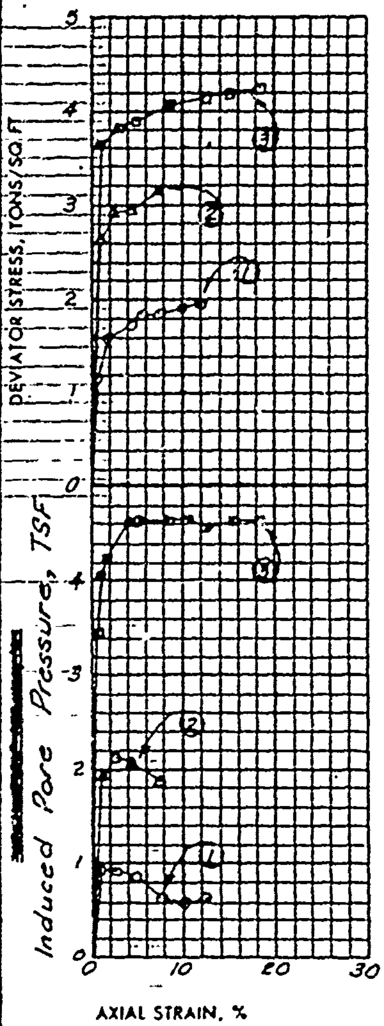
DEPTH 0.0 - 3.0

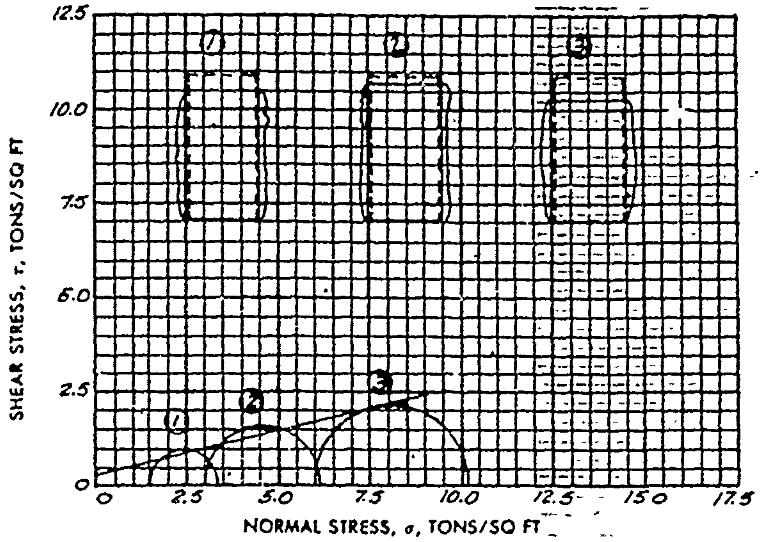
DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)


APPLIED STRESSES
135°
NORMAL STRESS, TSF
SHEAR STRESS, TSF
0
1
2
3
4
5
6
7
8
9
1
2
3
1
2
3
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
Sample No. M-12,500 (95 L,W)
Boring No. BR-20.5
Depth 2.0-3.0





SHEAR VALUES

ϕ = 13.0

TAN ϕ = .230

c = 0.3 TONS/SQ FT

	TEST NO		①	②	③	
INITIAL	WATER CONTENT	w_o	10.3 %	10.2 %	10.2 %	%
	VOID RATIO	e_o	.528	.516	.528	
	SATURATION	S_o	52 %	53 %	52 %	%
	DRY DENSITY LB/CU FT	γ_d	109.9	110.8	109.9	
BEFORE TEST	WATER CONTENT	w_c	20.4 %	20.2 %	20.6 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.50	3.00	6.00	
	VOID RATIO	e_c	.548	.542	.558	
FINAL	WATER CONTENT	w_f	20.4 %	20.2 %	20.6 %	%
	VOID RATIO At Failure	e_f	.548	.542	.558	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	3.34	6.14	10.20*	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.00	6.00	
TIME TO FAILURE, MIN			195	440	390*	
INITIAL DIAMETER, in.			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, in.			3.0	3.0	3.0	

TYPE TEST R
METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remarks IN./MIN

CLASSIFICATION CLAY (CL)

LL 30 PL 14 PI 16 G 2.69

REMARKS *At 15 % strain
Rate of strain:
Test #1 & 3, 0.001 in/min
Test #2, 0.0005 in/min

PROJECT Dierks Dam

AREA

BORING NO. BA-203 SAMPLE NO. (958, W-3) M-12,500

DEPTH 0.0 - 3.0 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) GPO 1964 OF—714-720

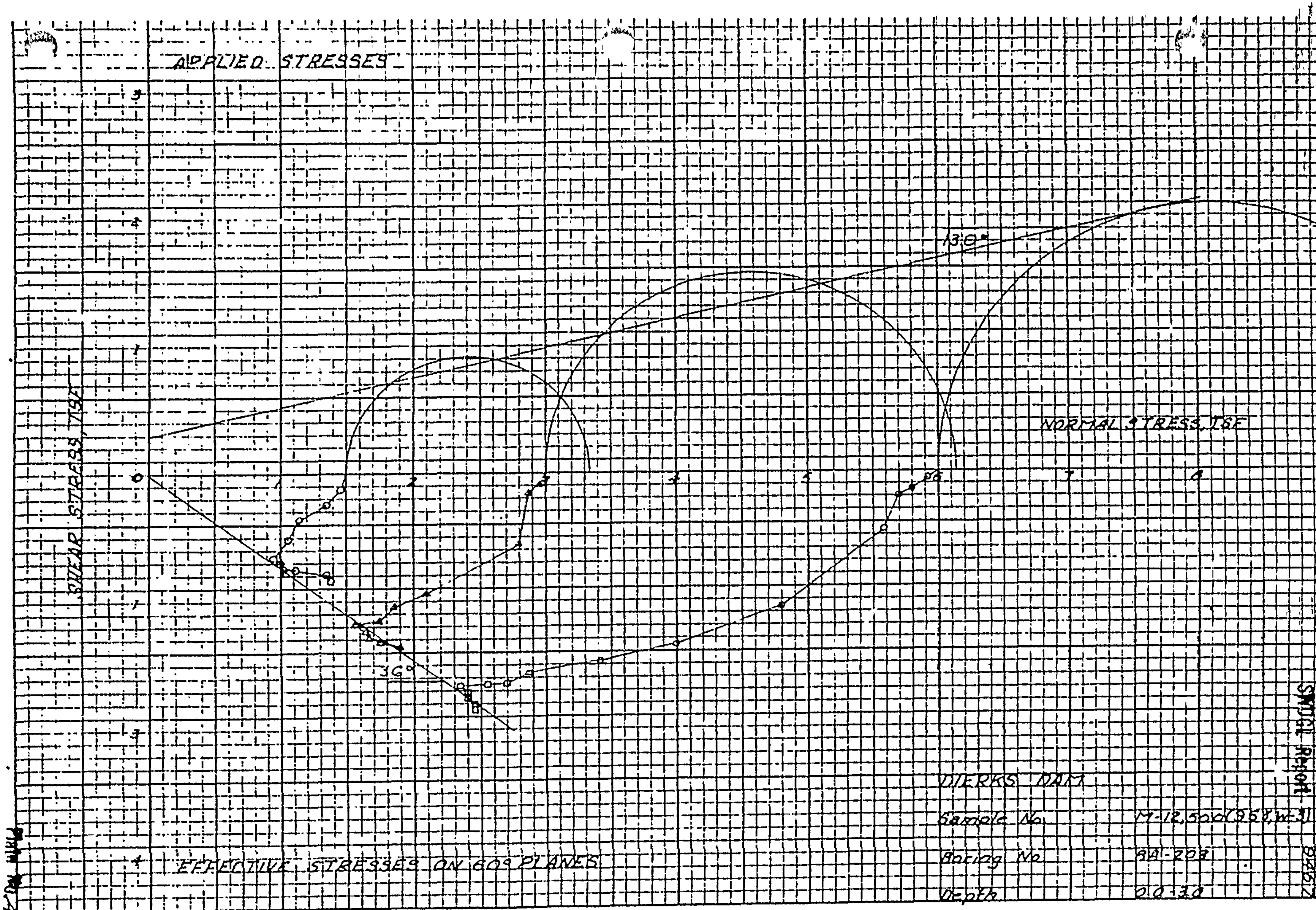
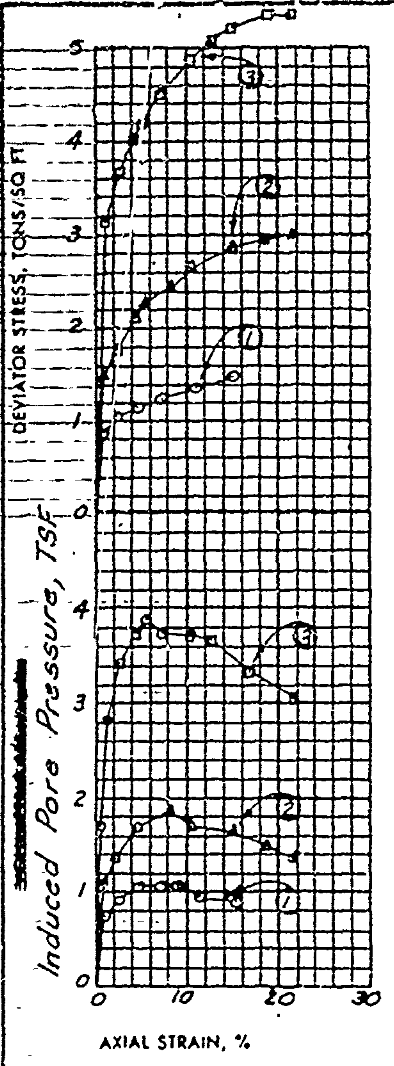
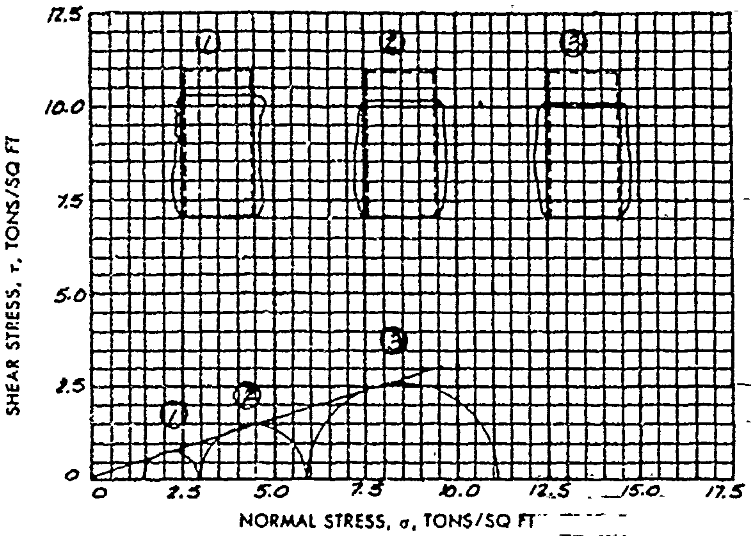

APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
Sample No
Boring No
Depth
SWDGL Report

Plate No. 42





SHEAR VALUES

ϕ = 17.2

TAN ϕ = .310

c = 0.1 TONS/SQ FT

	TEST NO		①	②	③	
INITIAL	WATER CONTENT	w_o	16.4 %	16.4 %	17.1 %	%
	VOID RATIO	e_o	.585	.572	.602	
	SATURATION	S_o	76 %	78 %	77 %	%
	DRY DENSITY LB/CU FT	γ_d	106.8	107.6	105.5	
BEFORE TEST	WATER CONTENT	w_c	22.4%	19.4%	17.2 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c	1.45	2.95	5.90	
	VOID RATIO	e_c	.604	.524	.466	
FINAL	WATER CONTENT	w_f	22.4%	19.4%	17.2%	%
	VOID RATIO At Failure	e_f	.604	.524	.466	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.93 #	5.85 #	11.11 #	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.45	3.00	5.90	
TIME TO FAILURE, MIN			410 #	450 #	320 #	
INITIAL DIAMETER, CM			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, CM			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remarks IN/MIN

CLASSIFICATION CLAY (CL)

LL 40 PL 13 PI 27 G 2.71

REMARKS # At 15% strain
Rate of strain:
Test # 1 & 2, 0.001 in/min.
Test # 3, 0.0015 in/min.

PROJECT Dierks Dam

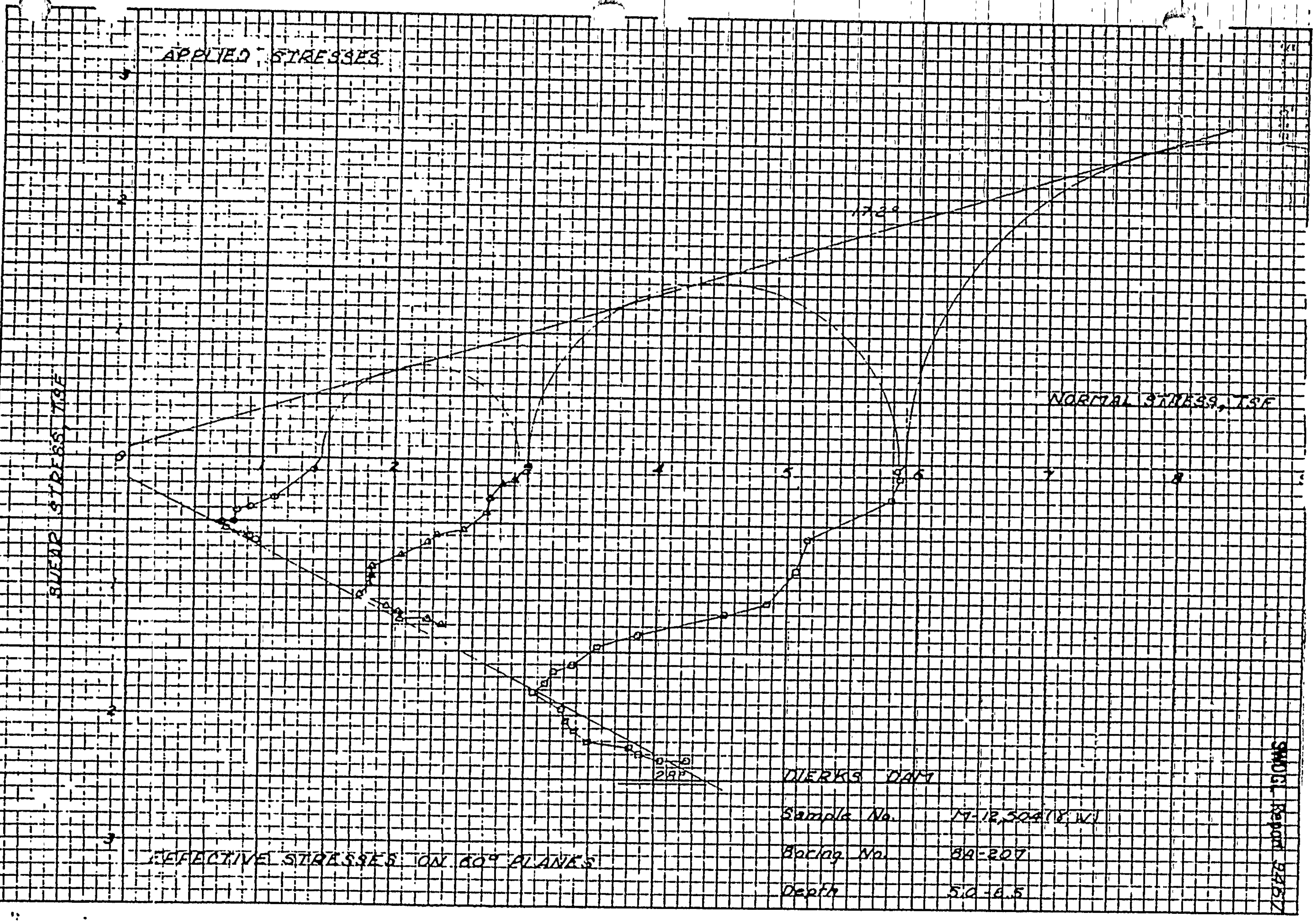
AREA

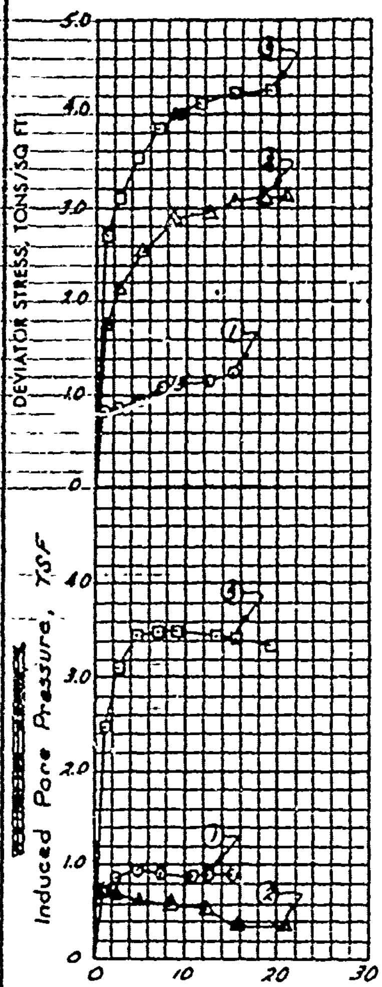
BORING NO. 8A-207 SAMPLE NO (8,W) M-12,504

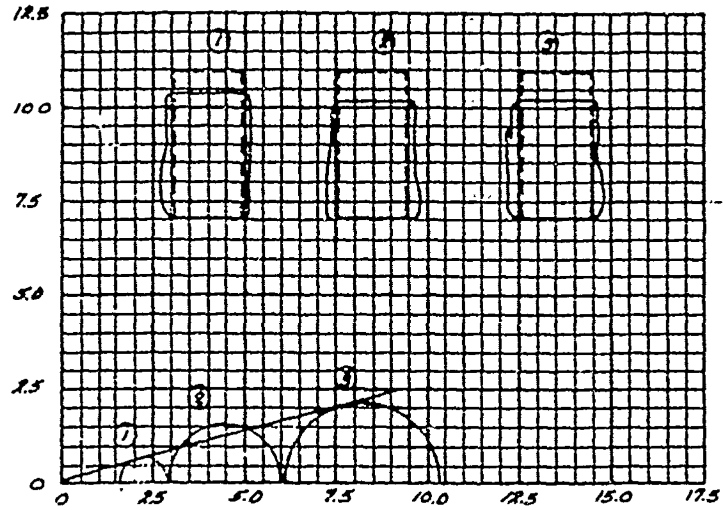
DEPTH 5.0 - 7.5 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)


APPLIED STRESSES
EFFECTIVE STRESSES ON 60° PLANES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
17.2°
28°
3
2
1
0
1
2
3
4
5
6
7
8
DIERKS DAM
Sample No. M-12,504 (E.W.)
Boring No. BA-207
Depth 5.0-6.5





SHEAR VALUES

φ = 14.6

TAN φ = .260

c = 0.0 TONS/SQ FT

			①	②	③	
TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	20.1 %	20.2 %	20.0 %	%
	VOID RATIO	e_o	.683	.662	.682	
	SATURATION	S_o	80 %	82 %	79 %	%
	DRY DENSITY LB/CU FT	γ_d	100.6	101.7	100.6	
BEFORE TEST	WATER CONTENT	w_c	22.1 %	20.1 %	19.0 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.65	2.95	6.10	
	VOID RATIO	e_c	.598	.544	.516	
FINAL	WATER CONTENT	w_f	22.1 %	20.1 %	19.0 %	%
	VOID RATIO (At Failure)	e_f	.598	.544	.516	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.87*	6.00*	10.31*	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.65	2.95	6.10	
TIME TO FAILURE, MIN			435*	315*	345*	
INITIAL DIAMETER, IN			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, IN			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back Pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.001 IN/MIN

CLASSIFICATION CLAY (CL)

LL 40 PL 13 PI 27 G_s 2.71

REMARKS * At 15% Strain

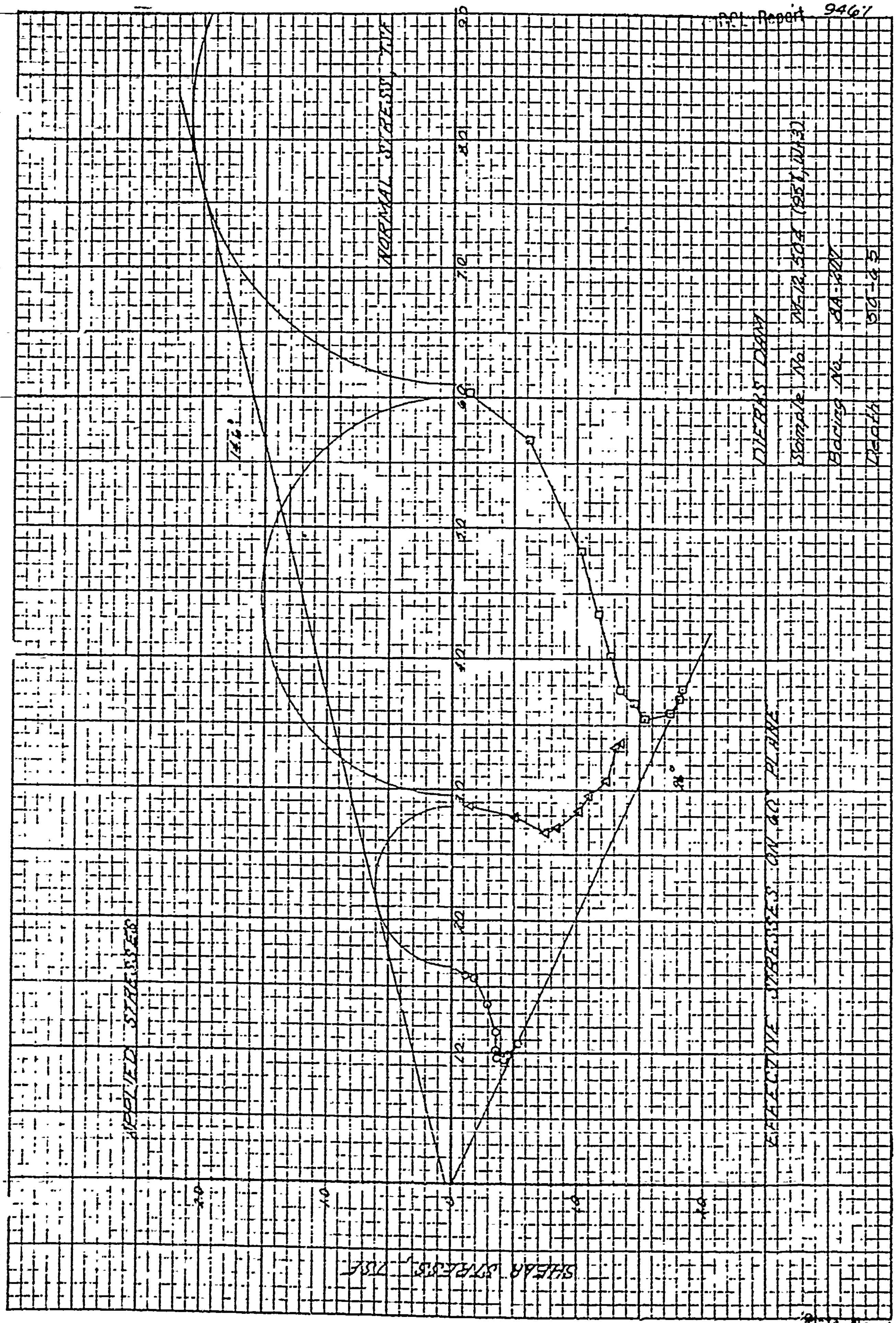
PROJECT Dierks Dam

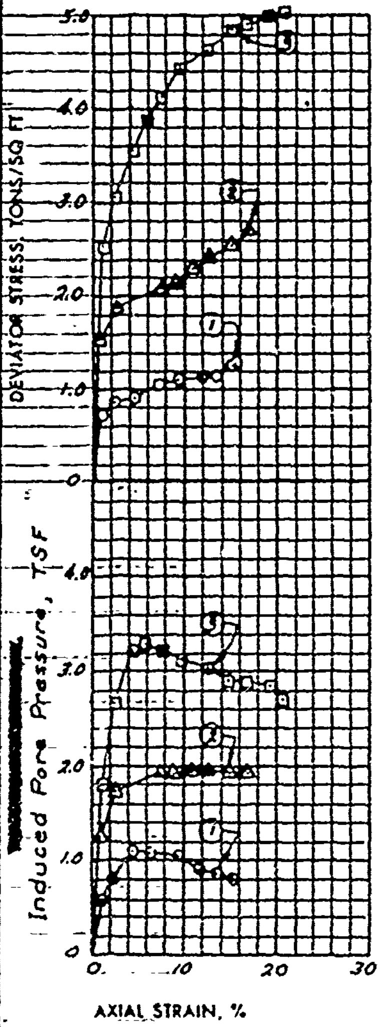
AREA

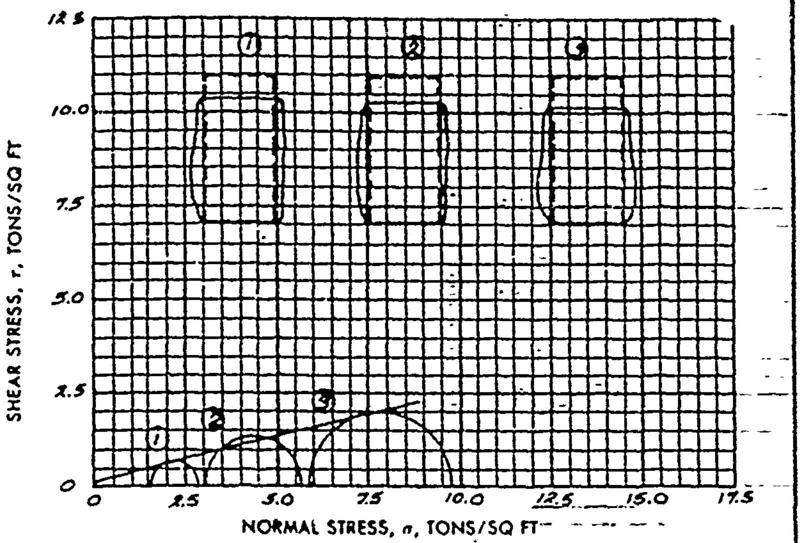
BORING NO. 8A-207 SAMPLE NO. (95%, W+3) M-12,504

DEPTH 5.0-6.5 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT


NORMAL STRESS, TSF
SHEAR STRESS, TSF
APPLIED STRESSES





SHEAR VALUES

φ = 13.6

TAN φ = .243

c = 0.1 TONS/SQ FT

	TEST NO		①	②	③	
INITIAL	WATER CONTENT	w_o	16.4 %	16.0 %	16.5 %	%
	VOID RATIO	e_o	.676	.654	.677	
	SATURATION	S_o	66 %	66 %	66 %	%
	DRY DENSITY LB/CU FT	γ_d	101.0	102.4	100.8	
BEFORE TEST	WATER CONTENT	w_c	22.3 %	19.4 %	18.9 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS, TONS/SQ FT	σ_c	1.60	3.05	5.90	
	VOID RATIO	e_c	.605	.526	.513	
FINAL	WATER CONTENT	w_f	22.3 %	19.4 %	18.9 %	%
	VOID RATIO (At Failure)	e_f	.605	.526	.513	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.85 *	5.63 *	9.73 *	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.60	3.05	5.90	
TIME TO FAILURE, MIN			430 *	360 *	335 *	
INITIAL DIAMETER IN			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, IN			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION Back Pressure ☐ CONTROLLED STRESS ☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN 0.001 IN/MIN

CLASSIFICATION CLAY (CL)

LL 40 | PL 13 | PI 27 | G_s 2.71

REMARKS *At 15 % Strain

PROJECT Dierks Dam

AREA

BORING NO. 8A-207 SAMPLE NO (95 Y, W) M-12,504

DEPTH 5.0-6.5 DATE NOV 65

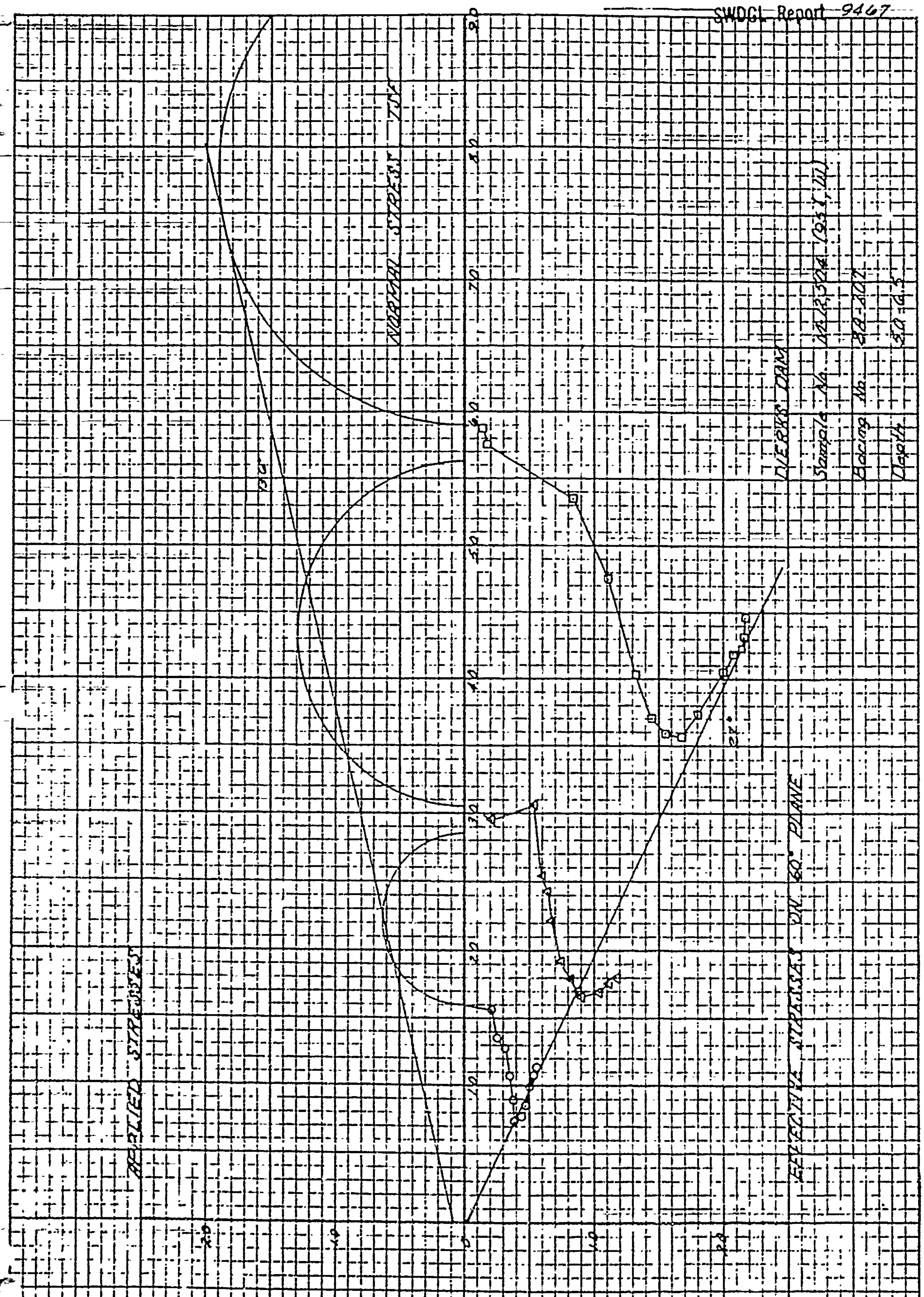
TRIAXIAL COMPRESSION TEST REPORT

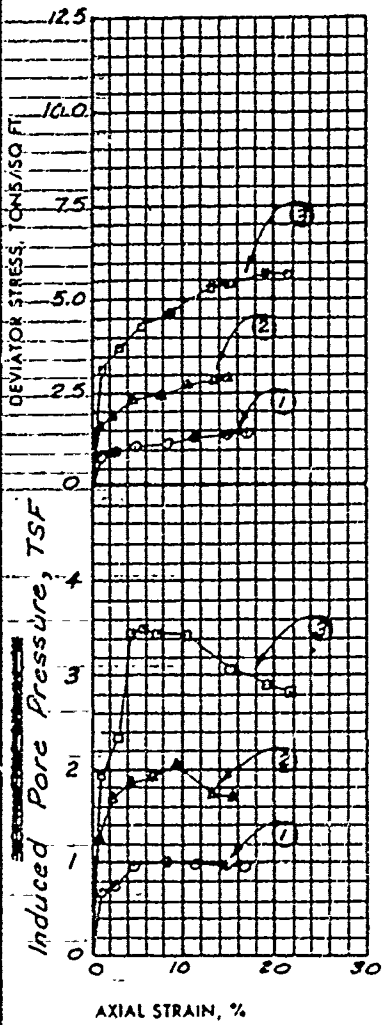
ENG FORM 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)
1 MAY 63

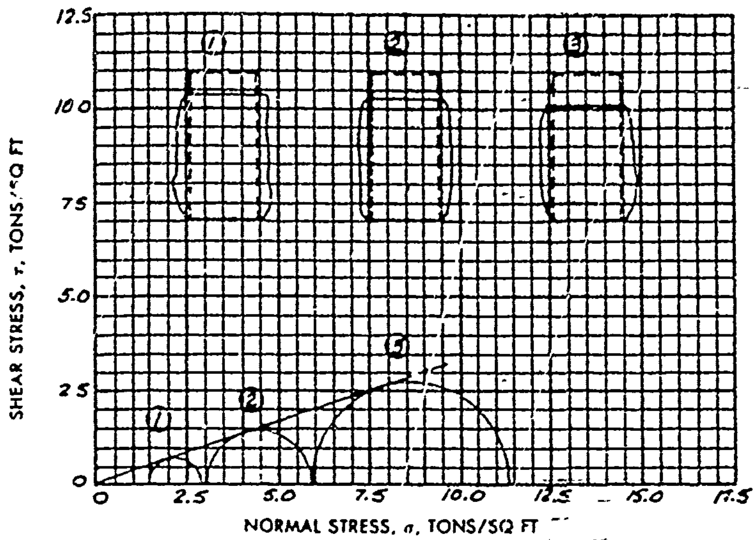
GPO 1964 OF-714-129

89

Plate No. 47


DIERKS DAM
NORMAL STRESS
SHEAR STRESS
APPLIED STRESSES
EFFECTIVE STRESSES ON 60° PLANE





TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	14.2 %	14.2 %	14.0 %	%
	VOID RATIO	e_o	.683	.670	.684	
	SATURATION	S_o	56 %	57 %	56 %	%
	DRY DENSITY LB/CU FT	γ_d	100.6	101.3	100.5	
BEFORE TEST	WATER CONTENT	w_c	23.1 %	19.4 %	17.6 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS., TONS/SQ FT	σ_c	1.50	3.05	5.95	
	VOID RATIO	e_c	.628	.527	.477	
FINAL	WATER CONTENT	w_f	23.1 %	19.4 %	17.6 %	%
	VOID RATIO At Failure	e_f	.628	.527	.477	
MAJOR PRINCIPAL STRESS, TONS/SQ FT		σ_1	2.90	5.94	11.34	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.05	5.95	
TIME TO FAILURE, MIN			395	375	310	
INITIAL DIAMETER, ~~CM~~ IN.			1.4	1.4	1.4	
INITIAL HEIGHT, H_o, ~~CM~~ IN.			3.0	3.0	3.0	

SHEAR VALUES

ϕ = 18.0

TAN ϕ .324

c = 0.0 TONS/SQ FT

TYPE TEST R

METHOD OF SATURATION Back pressure ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded RATE OF STRAIN See remarks IN./MIN

CLASSIFICATION CLAY (CL)

LL 40 PL 13 PI 27 G 2.71

REMARKS *At 15 % strain
Rate of strain:
Test #1 & 2 0.001 in./min.
Test #3, 0.0015 in./min.

PROJECT Dierks Dam

AREA

BORING NO. BA-207 SAMPLE NO. (938, W-2) M-12,504

DEPTH 5.0 - 6.5 DATE NOV 65

TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

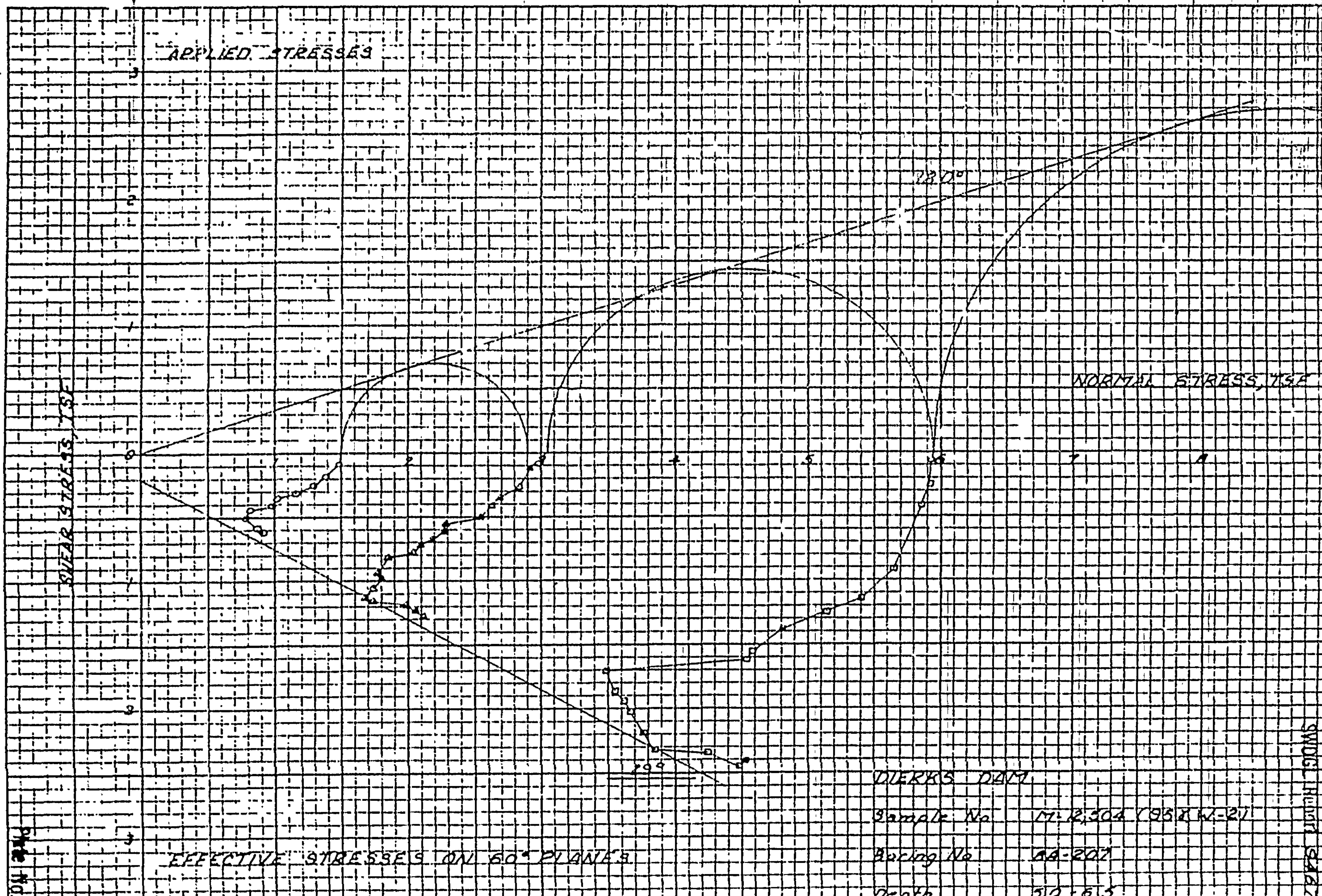
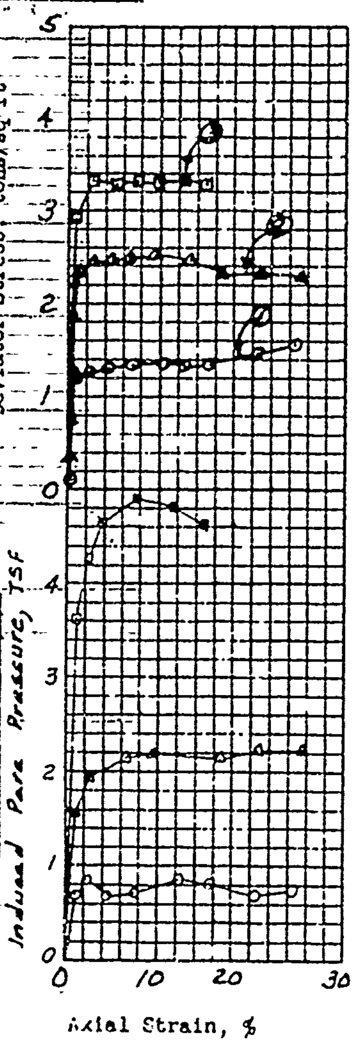
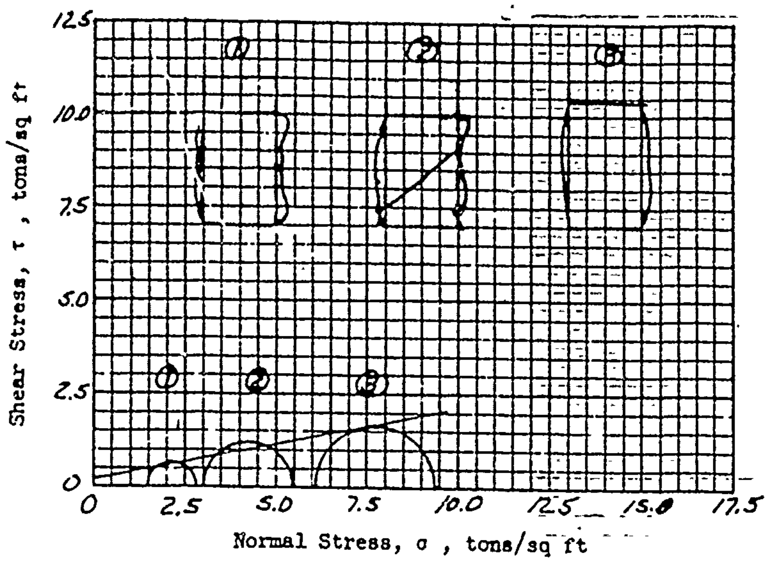

APPLIED STRESSES
EFFECTIVE STRESSES ON 60° PLANES
NORMAL STRESS, TSF
SHEAR STRESS, TSF
28.0°
DIERKS DAM
Sample No M-R,504 (95 K W-21)
Boring No AA-207
Depth 50-65
SWDGL Report 3467

Plate No. 50





Shear Values

ø = 11.0 °

tan ø = .194

c = 0.2 tons/sq ft

Test No.			1	2	3	
Initial	Water content	w_o	11.0 %	11.2 %	11.1 %	%
	Void ratio	e_o	.458	.457	.464	
	Saturation	S_o	64 %	66 %	64 %	%
	Dry density lb/cu ft	γ_d	114.8	114.9	114.3	
Before Test	Water content	w_c	17.7 %	17.3 %	17.3 %	%
	Saturation	S_c	100 %	100 %	100 %	%
	Consolidation press., tons/sq ft	$\bar{\sigma}_c$	1.50	3.00	6.05	
	Void ratio	e_c	.475	.463	.463	
Final	Water content	w_f	17.7 %	17.3 %	17.3 %	%
	Void ratio	e_f	.475	.463	.463	
Major principal stress, tons/sq ft		σ_1	2.85*	5.49	9.44	
Minor principal stress, tons/sq ft		σ_3	1.50	3.00	6.05	
Time to failure, min			260 +	160	310	
Initial diameter, ~~min.~~ in.			1.4	1.4	1.4	
Initial height, H_o, ~~min.~~ in.			3.0	3.0	3.0	

Type Test R

Method of Saturation Back pressure ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded	Rate of strain .001 (Nominal) in./min		
Classification SILT, sandy (ML)			
LL 17	PL 13	PI 4	~~D10~~ G 2.60

Remarks * At 15% strain
** Composite of samples No. M-12,508, -12,509, -12,510, & -12,511.

Project DIERKS DAM

Area Borrow Material

Boring No. GDC — 165

Sample No. (958, W) M-12 508C **

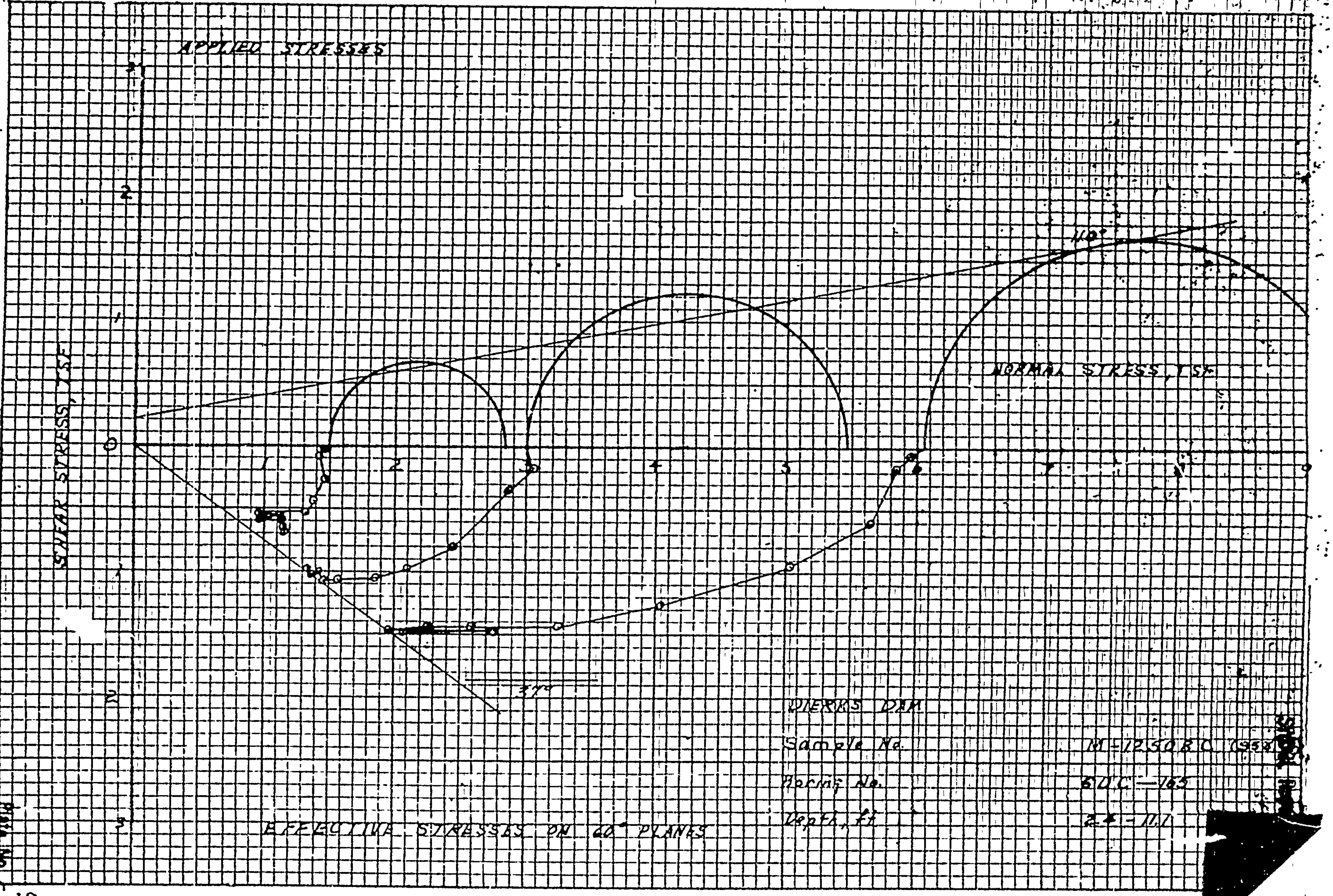
Depth ~~El~~ 2.4 - 11.1

Date FEB 66

TRIAXIAL COMPRESSION TEST REPORT

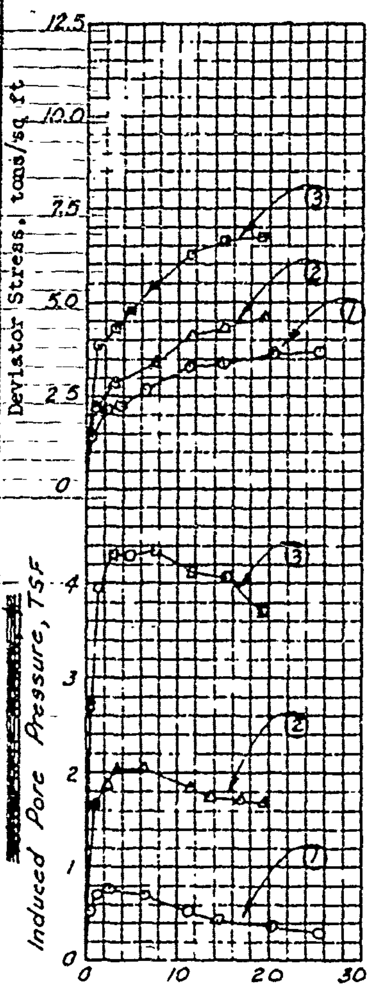
ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

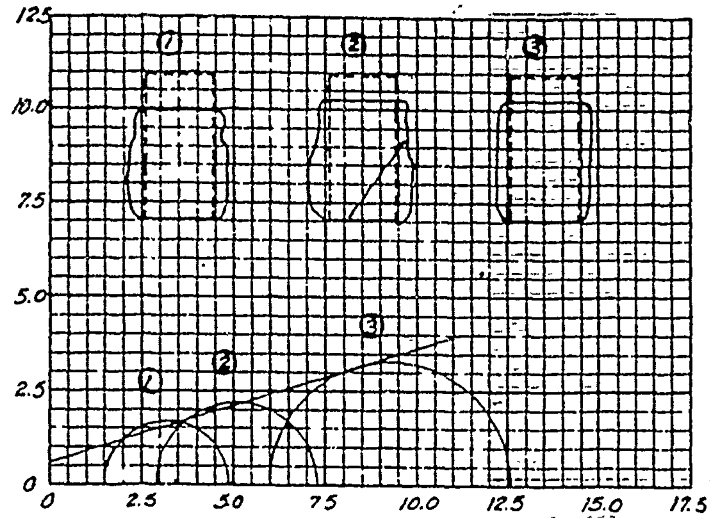
1 9428



APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
110°
37°
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
Sample No. M-12.50 R.C. (1954)
Boring No. 6 DC—165
Depth, ft 2.4 - 11.1

Plate No. 6





Shear Values

ø = 16.9 °

tan ø = .303

c = 0.6 tons/sq ft

Test No.			①	②	③	
Initial	Water content	w_o	14.1 %	14.3 %	13.9 %	%
	Void ratio	e_o	.457	.459	.461	
	Saturation	S_o	83 %	84 %	81 %	%
	Dry density lb/cu ft	γ_d	114.8	114.7	114.5	
Before Test	Water content	w_c	16.0 %	15.0 %	15.5 %	%
	Saturation	S_c	100 %	100 %	100 %	%
	Consolidation press., tons/sq ft	$\bar{\sigma}_c$	1.50	2.95	6.00	
	Void ratio	e_c	.430	.402	.407	
Final	Water content	w_f	16.0 %	15.0 %	15.5 %	%
	Void ratio	e_f	.430	.402	.407	
Major principal stress, tons/sq ft		σ_1	4.90 *	7.27 *	12.56 *	
Minor principal stress, tons/sq ft		σ_3	1.50	2.95	6.00	
Time to failure, min			255 *	350 *	380 *	
Initial diameter, in			1.4	1.4	1.4	
Initial height, H_o, in			3.0	3.0	3.0	

Type Test R

Method of Saturation Back pressure ☐ Controlled Stress ☑ Controlled Strain

Type of specimen Remolded	Rate of strain .0015 (Nominal) in./min		
Classification SILT, sandy (ML)			
LL 17	PL 13	PI 4	G 2.68

Remarks * At 15 % strain

** Composite of samples M-12,508, 12,509, 12,510 & 12,511

Project Dierks Dam

Area Borrow Material

Boring No. 6DC — 165

Sample No. M-12,508 C ** (95 8, W+3)

Depth 2.4 - 11.1

Date FEB 66

TRIAXIAL COMPRESSION TEST REPORT

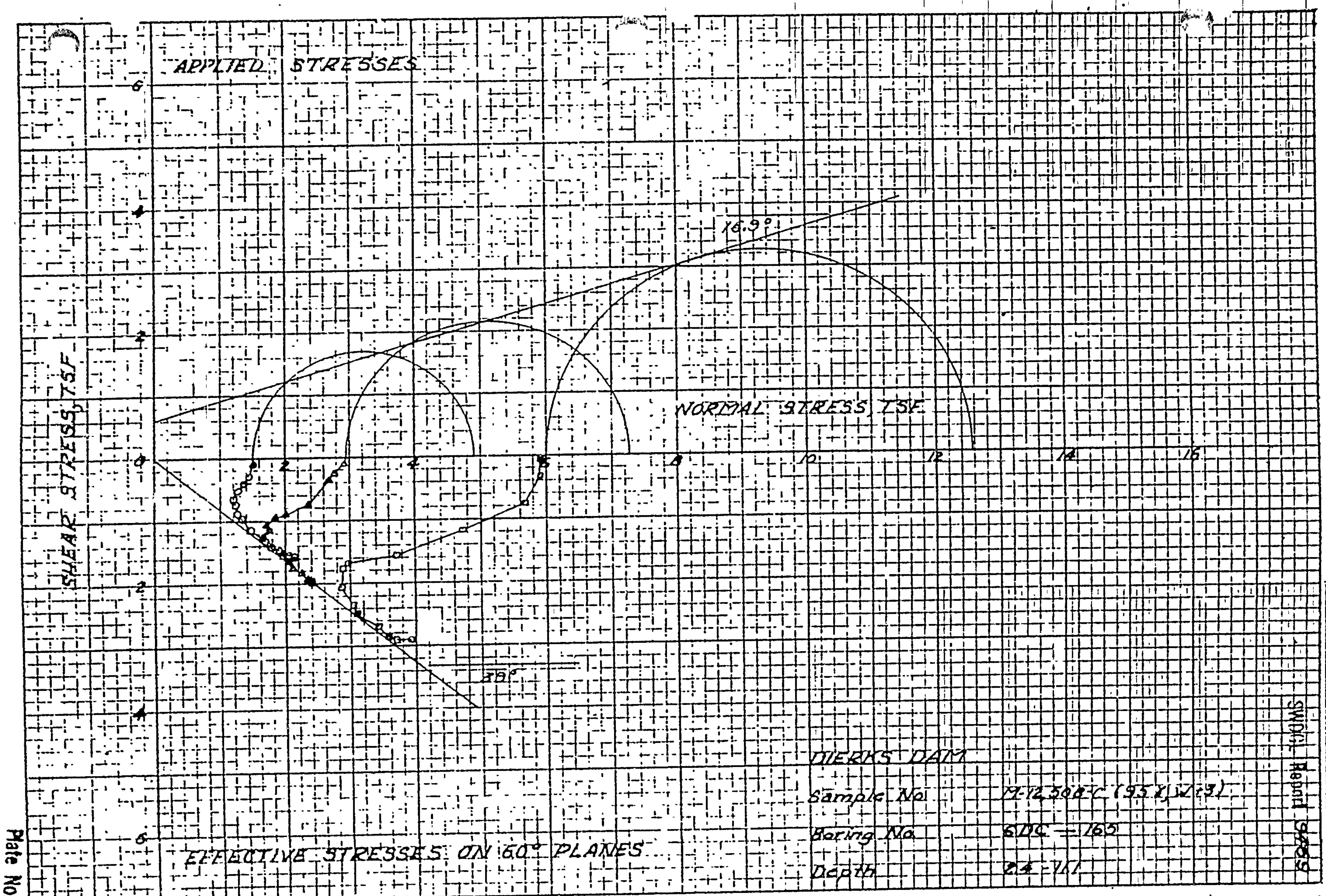
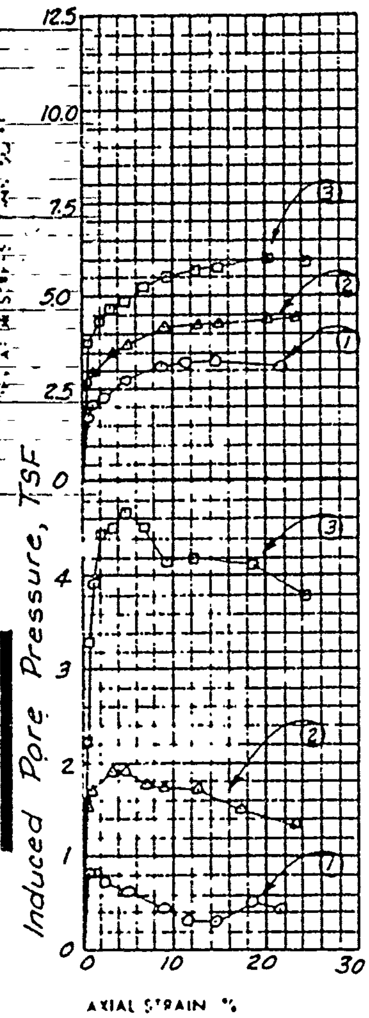
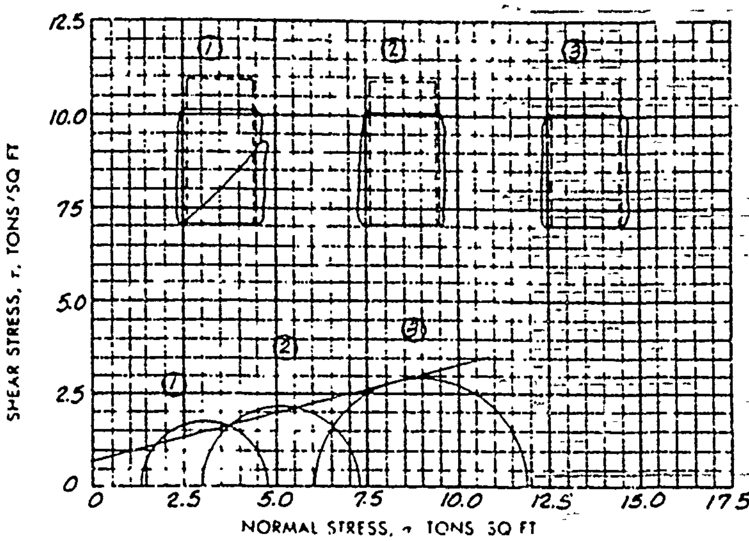

SWDGL Report 9489
APPLIED STRESSES
SHEAR STRESS TSF
NORMAL STRESS TSF
16.9°
38°
0
2
4
6
8
10
12
14
16
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
Sample No M-12,308-C (93 I, W-3)
Boring No 6DC — 165
Depth 24-141

Plate No.8





TEST NO			①	②	③	
INITIAL	WATER CONTENT		15.0	15.0	15.0	
	VOID RATIO		.477	.471	.479	
	SATURATION		84	85	84	
	DRY DENSITY LB CU FT		113.1	113.5	112.9	
BEFORE TEST	WATER CONTENT		17.4	16.6	16.1	
	SATURATION		100	100	100	
	CONSOLIDATION PRESS TONS SQ FT		1.40	3.00	6.05	
	VOID RATIO		.467	.444	.430	
FINAL	WATER CONTENT		17.4	16.6	16.1	
	VOID RATIO		.467	.444	.430	
MAJOR PRINCIPAL STRESS TONS SQ FT			4.70	7.31	11.93	
MINOR PRINCIPAL STRESS TONS SQ FT			1.40	3.00	6.05	
TIME TO FAILURE MIN			270	265	270	
INITIAL DIAMETER in			1.4	1.4	1.4	
INITIAL HEIGHT H_o, in.			3.0	3.0	3.0	

SHEAR VALUES

14.5

TAN φ .258

c 0.7 TONS/SQ FT

TYPE TEST R

METHOD OF SATURATION *Back pressure* ☐ CONTROLLED STRESS ✓ CONTROLLED STRAIN

TYPE OF SPECIMEN

RATE OF STRAIN 0.0015 (Nominal) IN/MIN

CLASSIFICATION SAND, clayey (SC)

LL 31 | PL 13 | PI 18 | G 268

REMARKS *Major principal stresses are based on maximum deviator stresses at or below 15% strain.*

PROJECT DIERKS DAM

AREA

BORING NO. 10A-2C-169

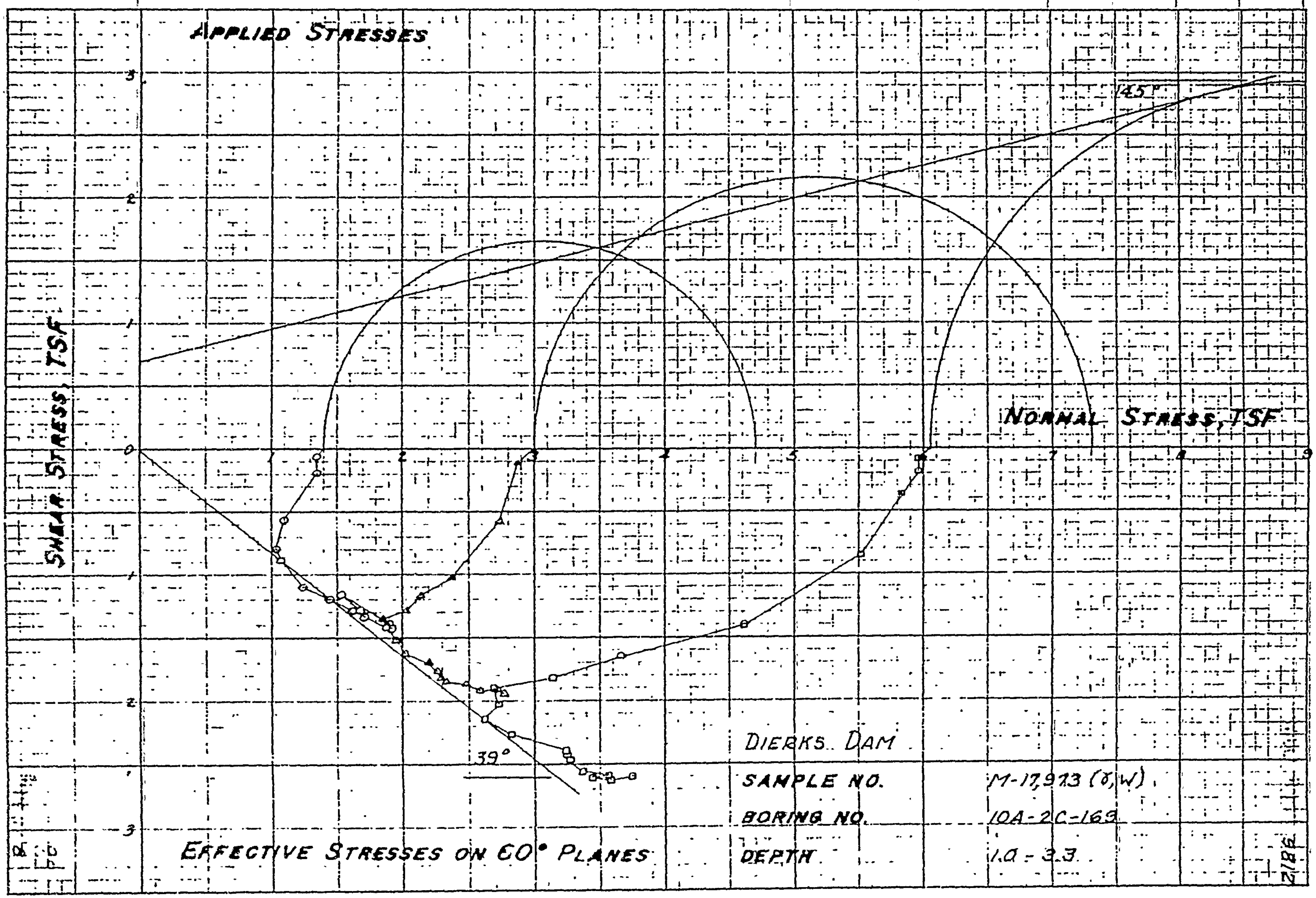
SAMPLE NO. (γ, W) M-17,973

DEPTH 1.0 - 3.3

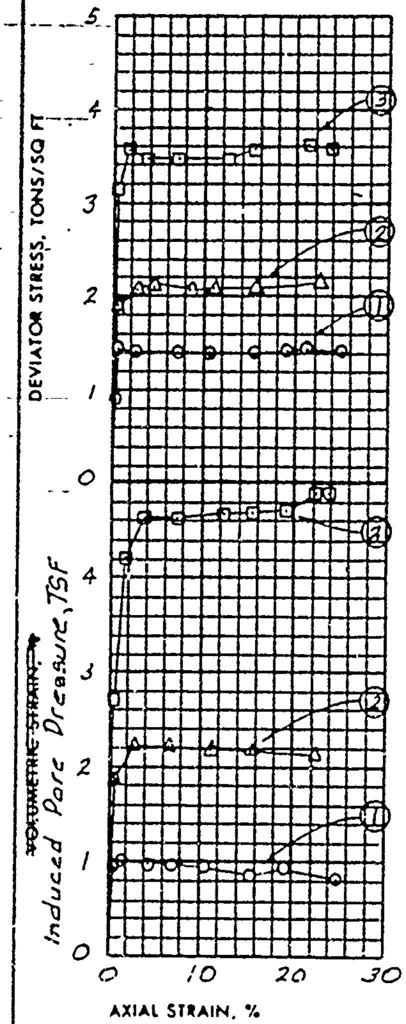
DATE

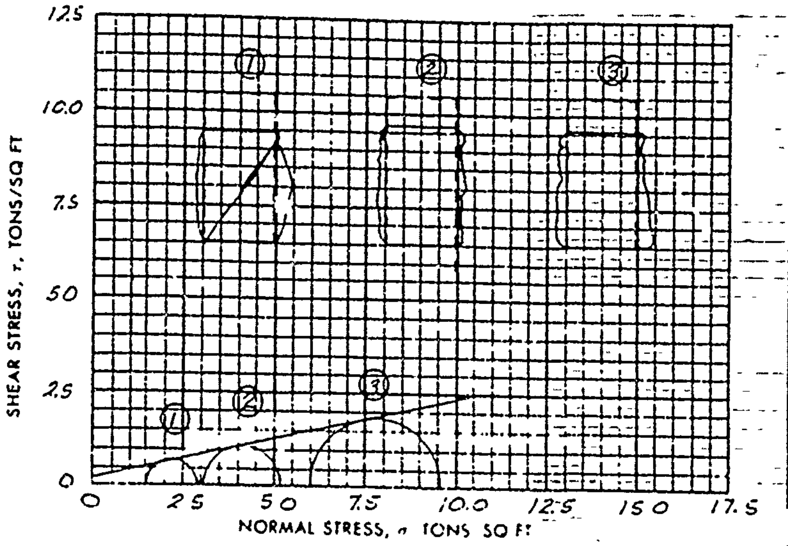
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 2089 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE TRANSLUCENT



APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
45°
39°
0
1
2
3
4
5
6
7
8
9
DIERKS DAM
SAMPLE NO.
M-17,973 (8,W)
BORING NO.
10A-2C-169
DEPTH
1.0 - 3.3
EFFECTIVE STRESSES ON 60° PLANES
9812





SHEAR VALUES

φ = 11.5

TAN φ = .203

c = 0.2 TONS/SQ FT

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	12.1%	11.9%	11.8%	%
	VOID RATIO	e_o	.546	.542	.546	
	SATURATION	S_o	59%	59%	58%	%
	DRY DENSITY LB/CU FT	γ_d	108.1	108.4	108.1	
BEFORE TEST	WATER CONTENT	w_c	20.3%	19.5%	17.4%	%
	SATURATION	S_c	100%	100%	100%	%
	CONSOLIDATION PRESS., TONS SQ FT	σ_c	1.45	3.05	6.00	
	VOID RATIO	e_c	.545	.522	.466	
FINAL	WATER CONTENT	w_f	20.3%	19.5%	17.4%	%
	VOID RATIO	e_f	.545	.522	.466	
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	2.94	5.16	9.54	
MINOR PRINCIPAL STRESS TONS/SQ FT		σ_3	1.50	3.05	6.00	
TIME TO FAILURE MIN			13	83	38	
INITIAL DIAMETER ~~CM~~			1.4	1.4	1.4	
INITIAL HEIGHT H_o, ~~CM~~			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION BACK PRESSURE ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN RATE OF STRAIN 0.0015 (NOMINAL) IN MIN

CLASSIFICATION SAND, clayey (SC)

LL 31	PL 13	PI 18	~~G~~ G 2.68

REMARKS

PROJECT Dierks Dam

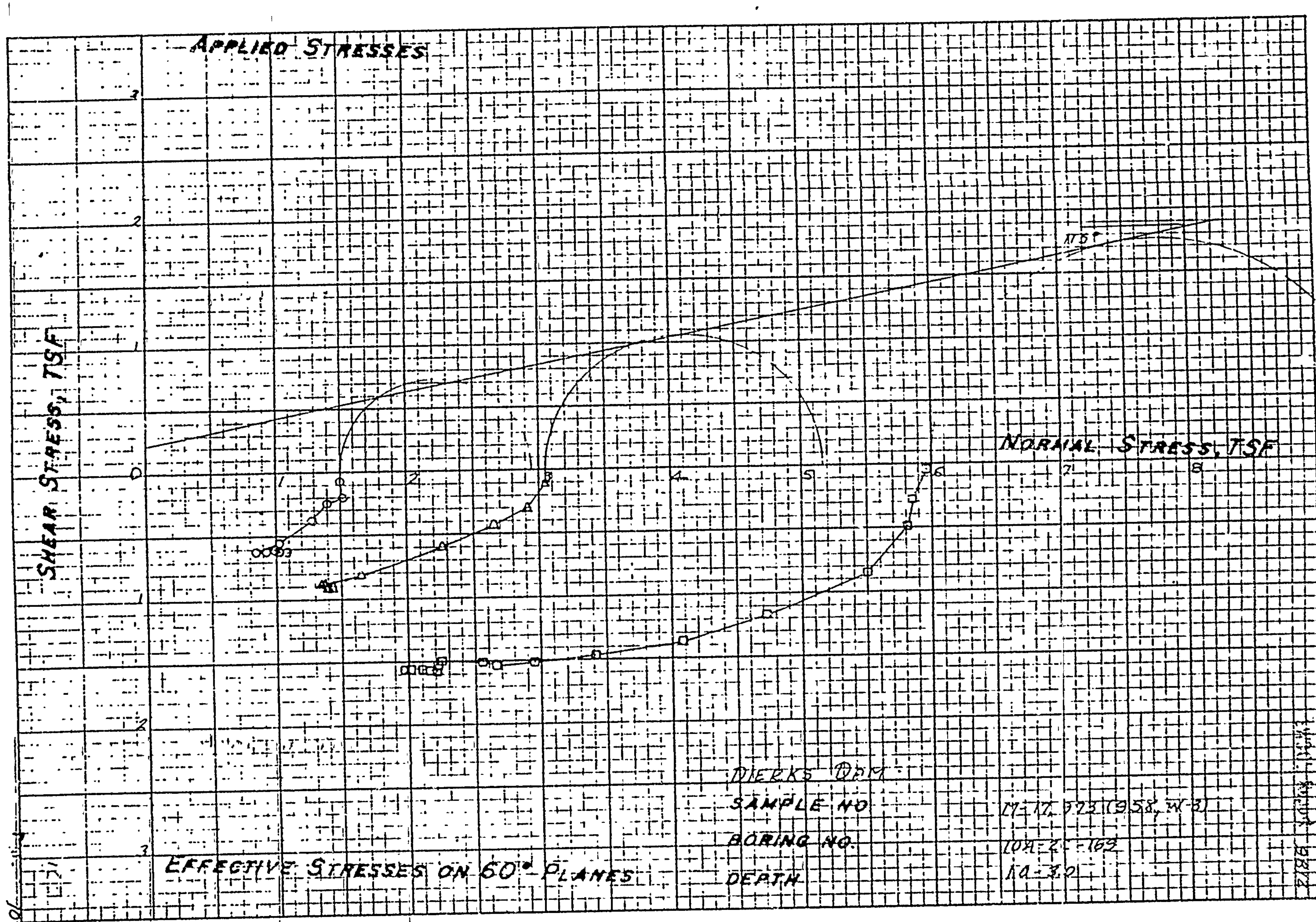
AREA

BORING NO 10A-2C-169 SAMPLE NO (958, W-3) M-17 973

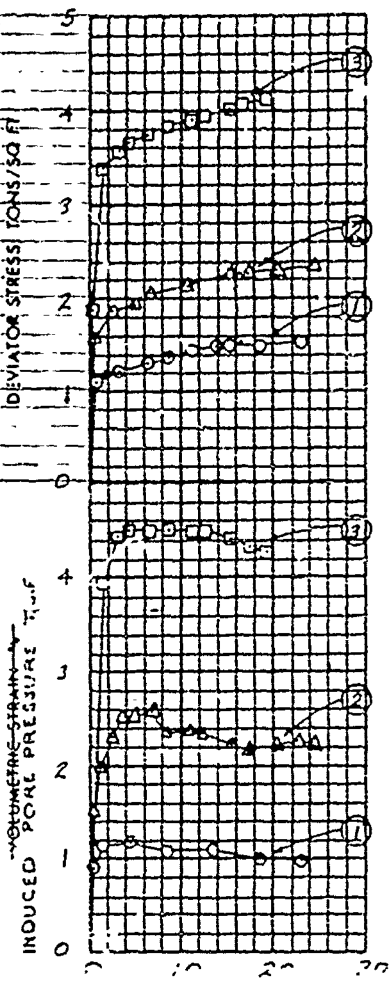
DEPTH ~~ft~~ 1.0-3.3 DATE

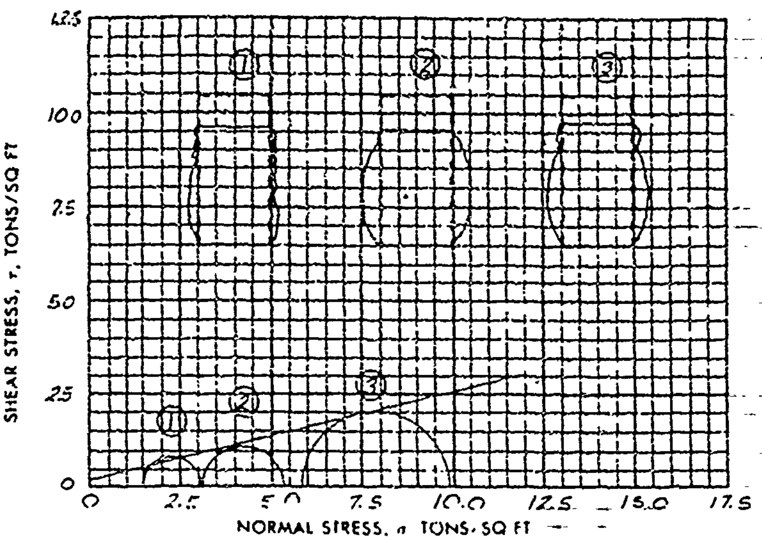
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)



APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
SAMPLE NO
BORING NO.
DEPTH





SHEAR VALUES

φ = 13.3

TAN φ = .237

c = 0.2 TONS/SQ FT

TEST NO			①	②	③
INITIAL	WATER CONTENT	w_o	14.8%	14.9%	14.9%
	VOID RATIO	e_o	.554	.552	.569
	SATURATION	S_o	72%	72%	70
	DRY DENSITY LB/CU FT	γ_d	107.7	107.9	106.7
BEFORE TEST	WATER CONTENT	w_c	20.0%	18.9%	17.1%
	SATURATION	S_c	100%	100%	100%
	CONSOLIDATION PRESS TONS/SQ FT	σ_c	1.50	3.05	5.85
	VOID RATIO	e_c	.535	.506	.460
FINAL	WATER CONTENT	w_f	20.0%	18.9%	17.1%
	VOID RATIO	e_f	.535	.506	.460
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	3.01	5.35	9.85
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.10	5.85
TIME TO FAILURE, MIN			292	263	340
INITIAL DIAMETER ~~CM~~ in			1.4	1.4	1.4
INITIAL HEIGHT, H_o, ~~CM~~ in			3.0	3.0	3.0

TYPE TEST R

METHOD OF SATURATION BACK PRESSURE ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN RATE OF STRAIN 0.0015 NOMINAL % MIN

CLASSIFICATION SAND, Clayey (SC)

LL 31 PL 13 PI 18 G 2.68

REMARKS Major principal stresses are based on maximum deviator stresses at or below 15% strain.

PROJECT Dierks Dam

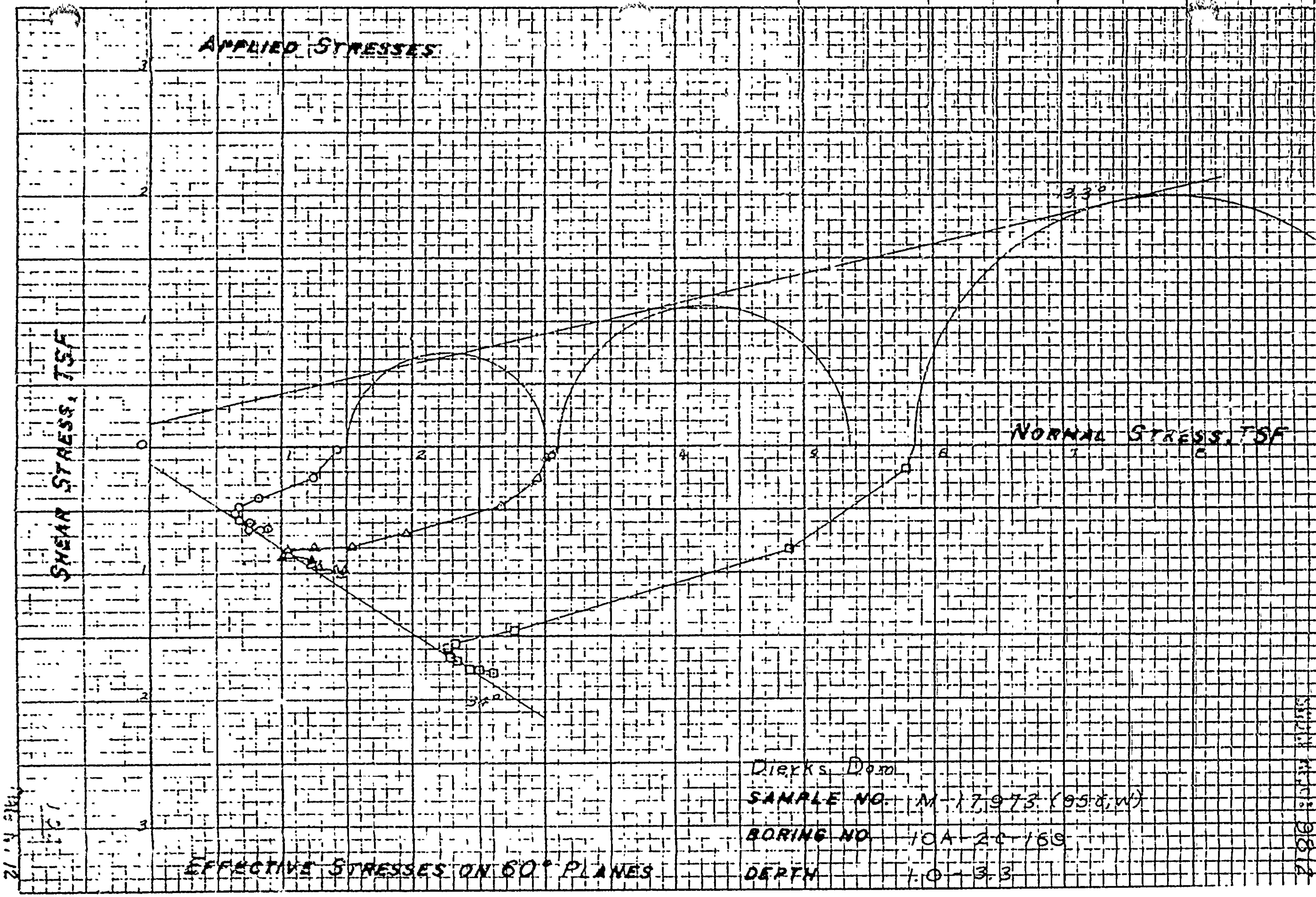
AREA

BORING NO 10A-2C-169 SAMPLE NO (958, W) M-17973

DEPTH ~~ft~~ 10-3.3 DATE

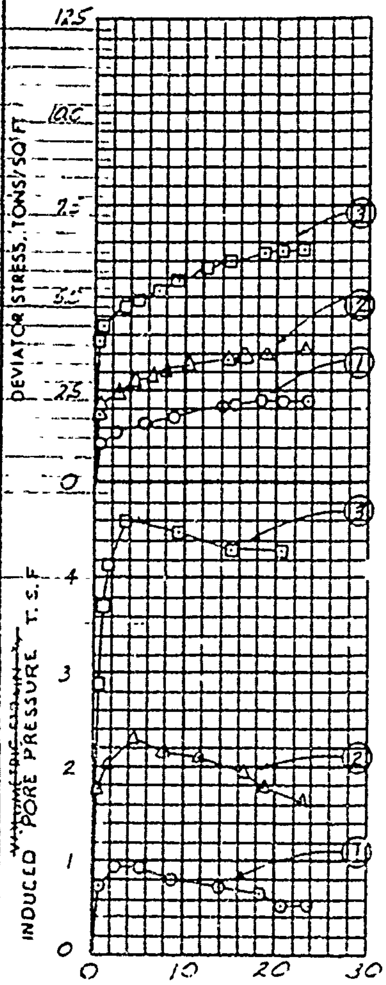
TRIAXIAL COMPRESSION TEST REPORT

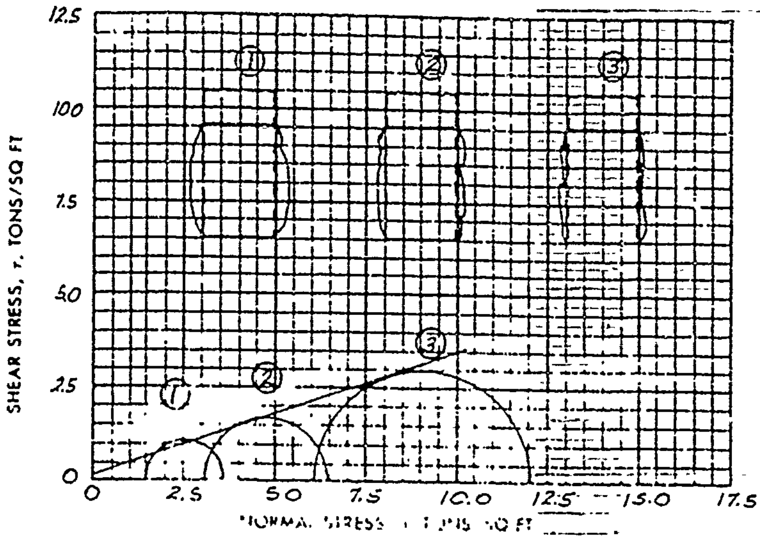
ENG FORM 2089 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)



APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
33°
34°
EFFECTIVE STRESSES ON 60° PLANES
Dierks Dam
SAMPLE NO. M-17,973 (95 d,w)
BORING NO. 10A-2C-169
DEPTH 1.0-3.3

Plate No. 12





SHEAR VALUES

φ = 18.1°

TAN φ = .327

c = .02 TONS/SQ FT

			①	②	③	
INITIAL	WATER CONTENT	w_o	17.9 %	18.0 %	17.9 %	%
	VOID RATIO	e_o	.554	.553	.555	
	SATURATION	S_o	87 %	87 %	86 %	%
	DRY DENSITY LB/CU FT	γ_d	107.6	107.6	107.3	
BEFORE TEST	WATER CONTENT	w_c	18.5 %	17.3 %	16.0 %	%
	SATURATION	S_c	100 %	100 %	100 %	%
	CONSOLIDATION PRESS TONS/SQ FT	σ_c	1.50	3.10	6.05	
	VOID RATIO	e_c	.497	.463	.429	
FINAL	WATER CONTENT	w_f	18.5 %	17.3 %	16.0 %	%
	VOID RATIO	e_f	.497	.463	.429	
MAJOR PRINCIPAL STRESS TONS/SQ FT		σ_1	3.55	6.48	12.05	
MINOR PRINCIPAL STRESS, TONS/SQ FT		σ_3	1.50	3.10	6.05	
TIME TO FAILURE MIN			272	274	275	
INITIAL DIAMETER ~~CM~~ IN			1.4	1.4	1.4	
INITIAL HEIGHT H_o, ~~CM~~ IN			3.0	3.0	3.0	

TYPE TEST R

METHOD OF SATURATION BACK PRESSURE ☐ CONTROLLED STRESS ☒ CONTROLLED STRAIN

TYPE OF SPECIMEN		RATE OF STRAIN 0.0015 (NOMINAL) IN/MIN	
CLASSIFICATION SAND, clayey (SC)			
LL 31	PL 13	PI 18	G_s 2.68

REMARKS

Major principal stresses are based on maximum deviator stresses at or below 15% strain.

PROJECT Dierks Dam

AREA

BORING NO 10A-2C-169

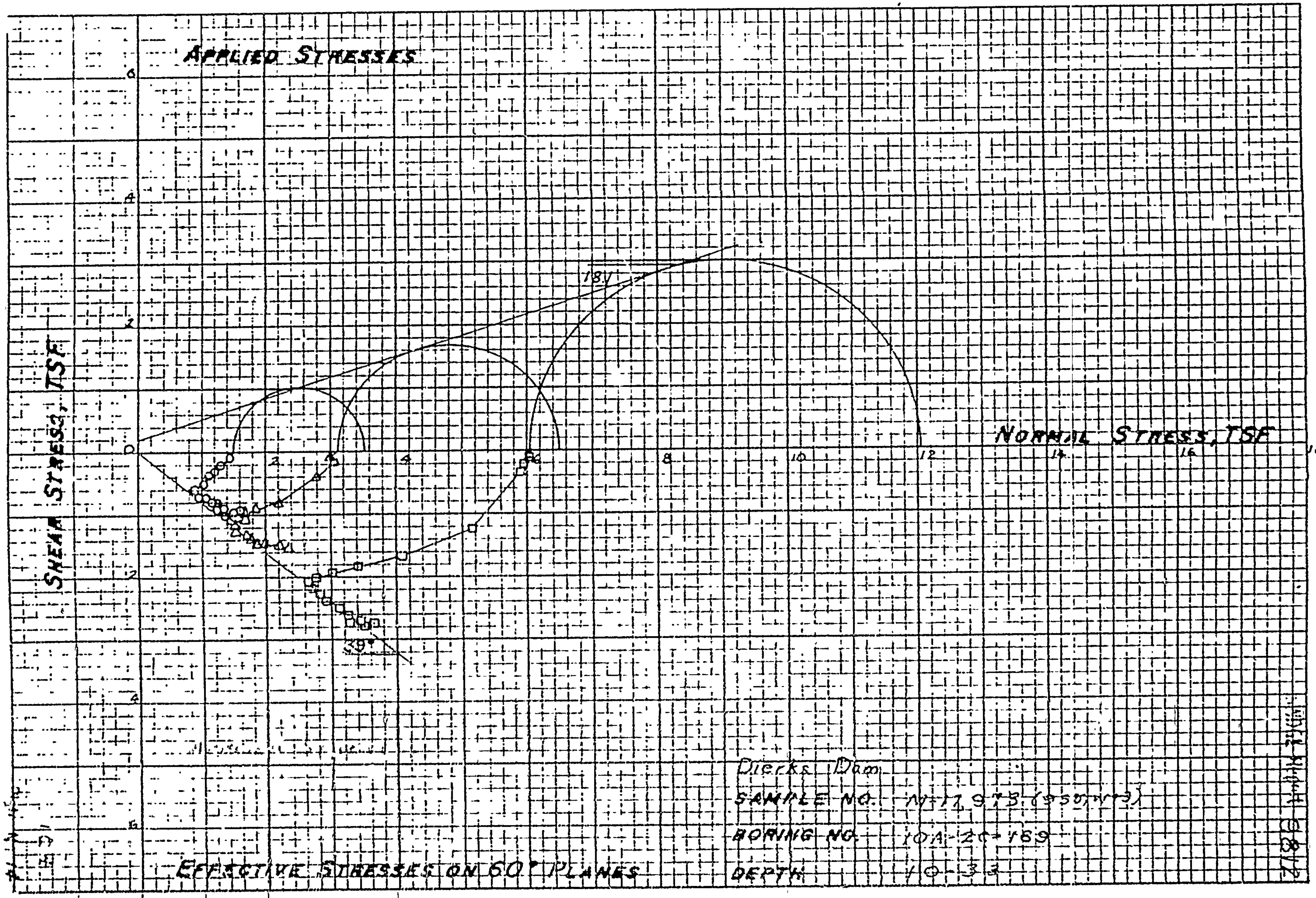
SAMPLE NO (958, W+3) M-17,973

DEPTH ~~ft~~ 1.0-3.3

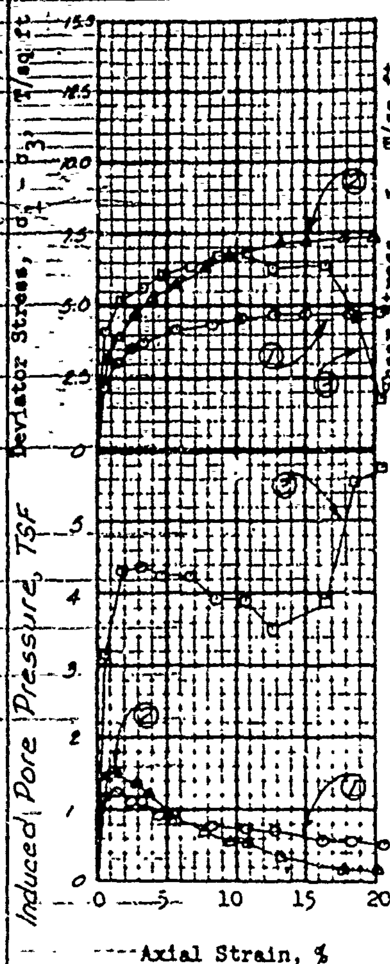
DATE

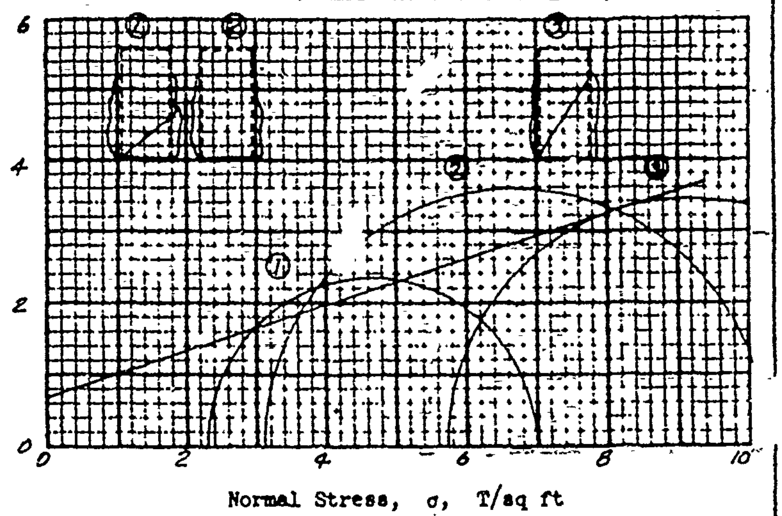
TRIAXIAL COMPRESSION TEST REPORT

ENG FORM 1 MAY 63 2089 PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)



APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
18°
39°
EFFECTIVE STRESSES ON 60° PLANES
Dierks Dam
SAMPLE NO. N-17,973 (950, 443)
BORING NO. 10A-2C-169
DEPTH 10-33





Test No.			①	②	③	
Initial	Water content	w_o	12.7 %	12.8 %	12.8 %	%
	Void ratio	e_o	.421	.408	.427	
	Saturation	S_o	81 %	84 %	81 %	%
	Dry density, lb/cu ft	γ_d	118.2	119.2	117.6	
Before Shear	Water content	w_c	15.5 %	14.9 %	16.1 %	%
	Void ratio	e_c	.416	.401	.432	
	Saturation	S_c	100 %	100 %	100 %	%
	Final back pressure, T/sq ft	u_o	6.66	10.40	10.79	
Final	Water content	w_f	15.5 %	14.9 %	16.1 %	%
	Void ratio	e_f	.416	.401	.432	
Minor principal stress, T/sq ft		σ_3	2.30	3.10	5.75	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	4.67	7.16	6.84	
Time to failure, min		t_f	270	260	170	
Rate of strain, percent/min			0.06	0.06	0.06	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = 17.6 °

tan ϕ = .328

c = 0.7 T/sq ft

Method of saturation Back pressure

☐ Controlled stress

☑ Controlled strain

Type of test R | Type of specimen [illegible]

Classification CLAY, sandy (CL) — Composite of minus No. 10 fractions of SWD Samples M-18,564, -18565, and -18567.

LL 25 | PL 12 | PI 13 | G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

Test No.3 probably had a membrane leak after failure.

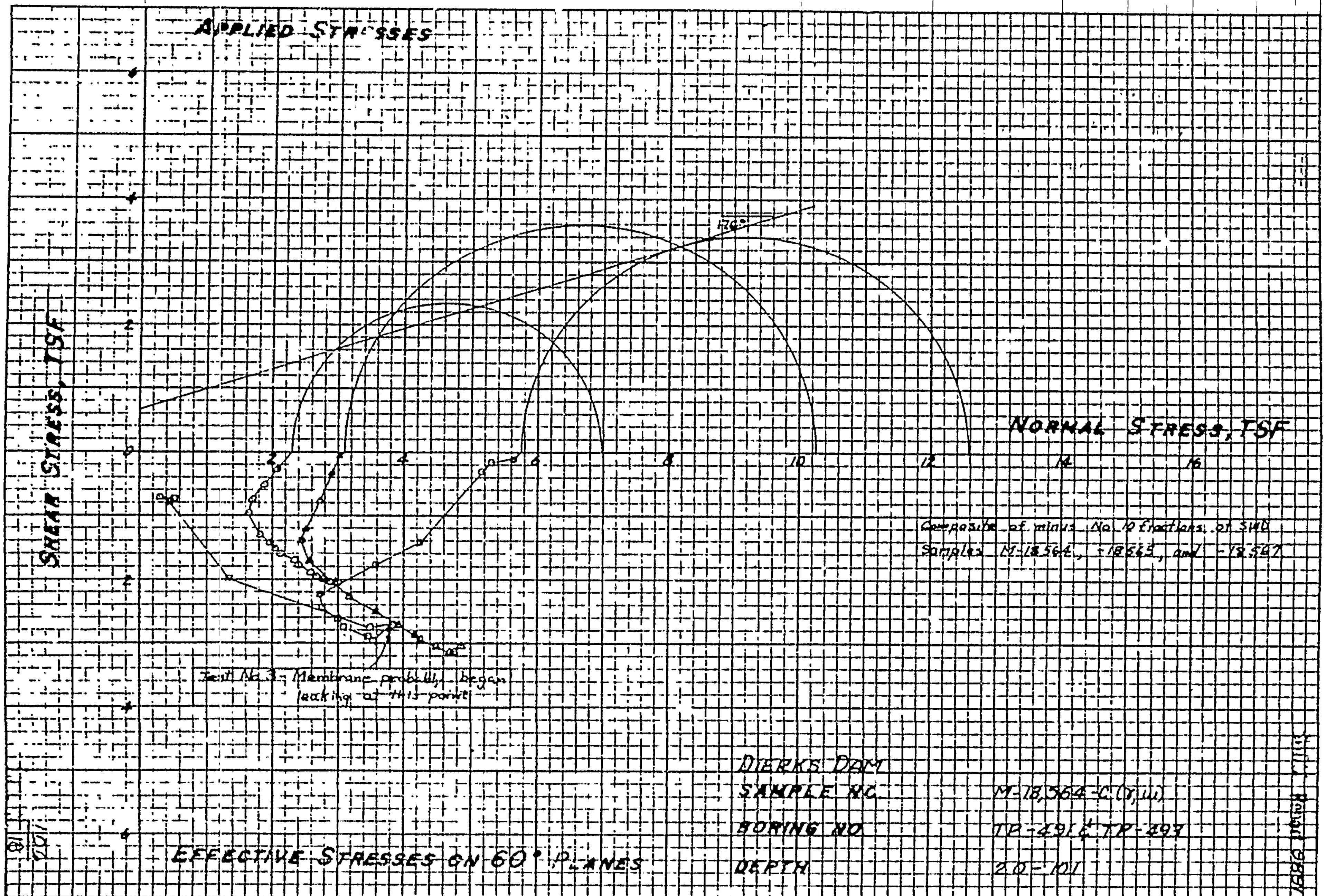
Project DIERKS DAM

Area Borrow M[illegible]

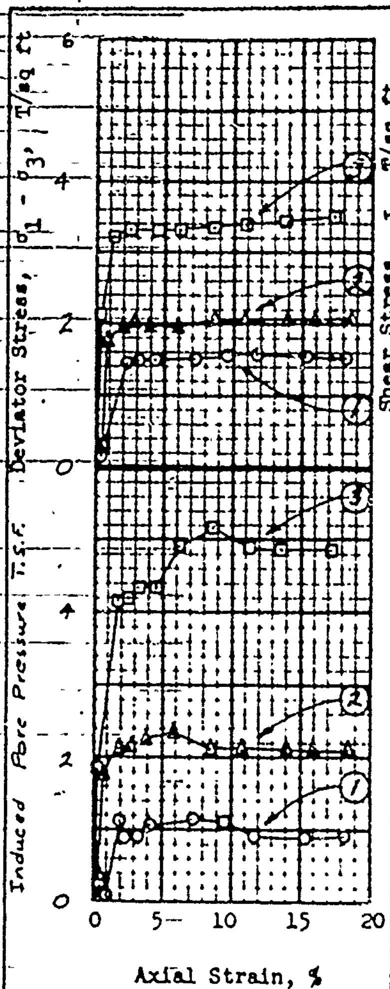
Boring No. TP-491 & TP-493 | Sample No. M-18,564-C (8,W)

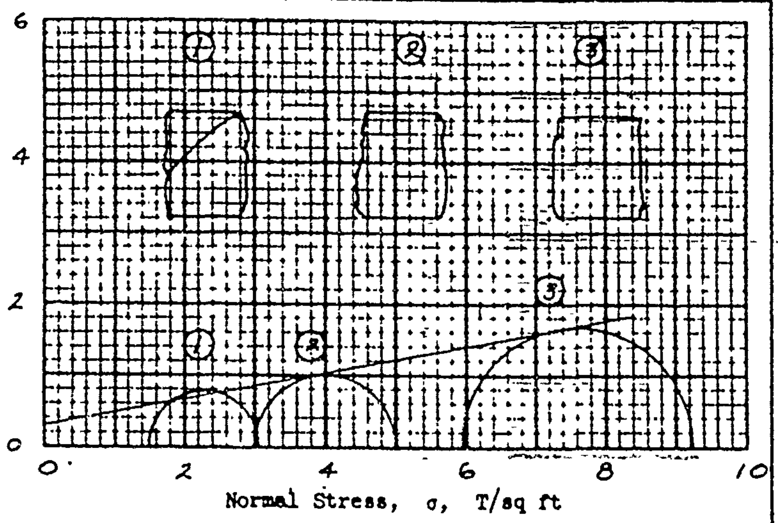
Depth [redacted] 2.0-10.1 | Date

TRIAXIAL COMPRESSION TEST REPORT



Applied Stresses
Shear Stress, TSF
Normal Stress, TSF
Test No. 3 - Membrane probably began leaking at this point
Composite of minus No. 4 fractions of SWD Samples M-18564, -18565, and -18567
Dierks Dam
Sample No. M-18,564-C(T,U)
Boring No. TP-491 & TP-497
Depth 2.0-10.1
Effective Stresses on 60° Planes
100
18





Test No.			①	②	③	
Initial	Water content	w_o	10.1 %	10.2 %	9.9 %	%
	Void ratio	e_o	.505	.501	.509	
	Saturation	S_o	54 %	55 %	53 %	%
	Dry density, lb/cu ft	γ_d	111.6	111.9	111.3	
Before Shear	Water content	w_c	17.8 %	17.5 %	15.5 %	%
	Void ratio	e_c	.478	.472	.416	
	Saturation	S_c	100 %	100 %	100 %	%
	Final back pressure, T/sq ft	u_o	14.91	18.28	15.51	
Final	Water content	w_f	17.8 %	17.5 %	15.5 %	%
	Void ratio	e_f	.478	.472	.416	
Minor principal stress, T/sq ft		σ_3	1.50	3.00	5.95	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.56	2.00	3.30	
Time to failure, min		t_f	196	53	43	
Rate of strain, percent/min			0.06	0.05	0.06	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = 10.3 °

tan ϕ = .182

c = 0.3 T/sq ft

Method of saturation Back Pressure

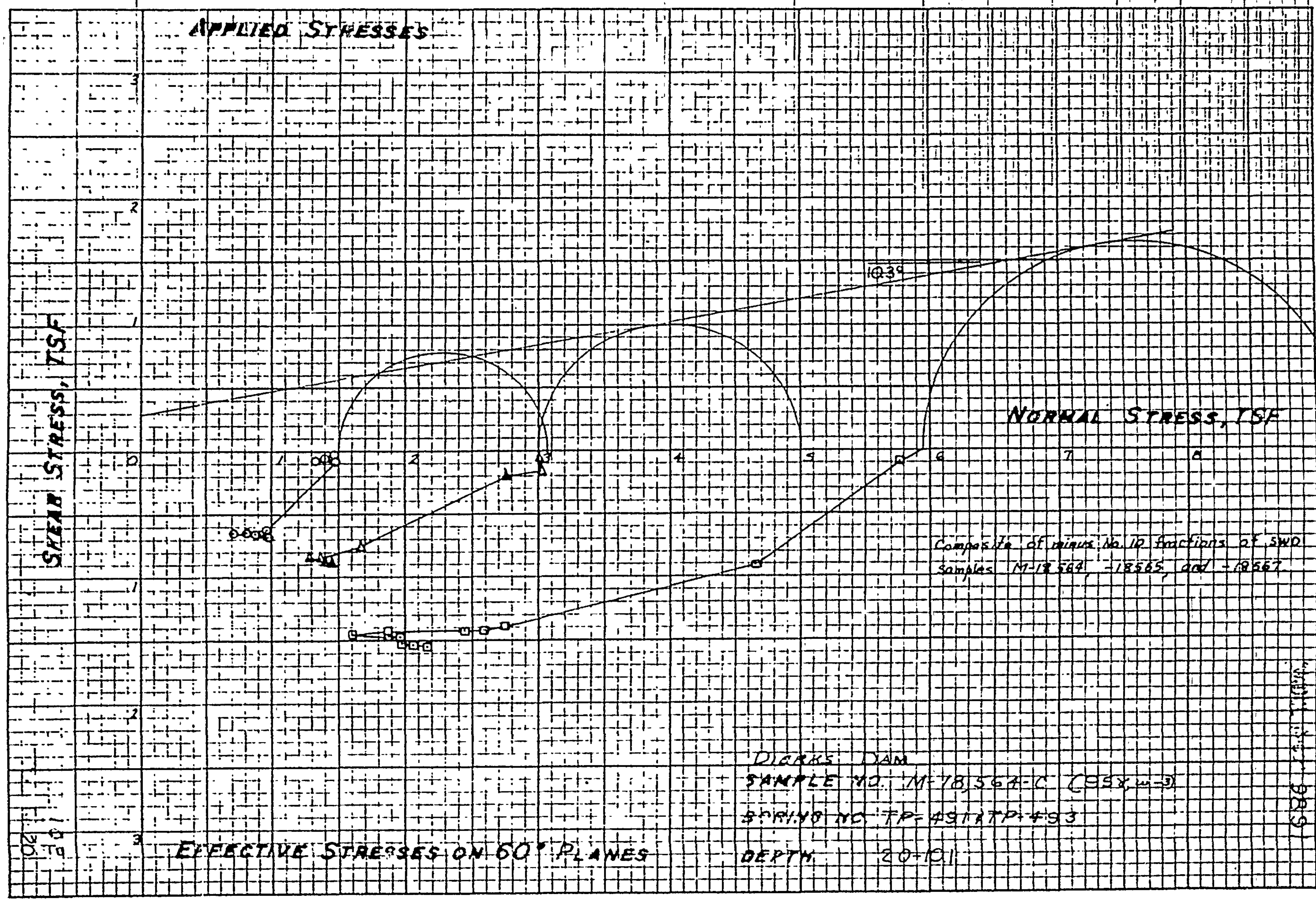
☐ Controlled stress

☑ Controlled strain

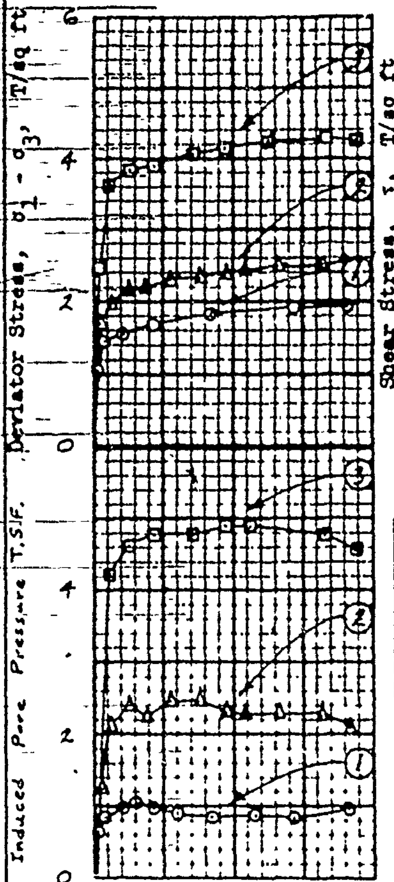
Type of test R	Type of specimen Remold			
Classification CLAY sandy (CL)	Composite of minus No. 10 fractions of SWD samples M-18564, -18565, and -18567			
LL 25	PL 12	PI 13		G_s 2.69

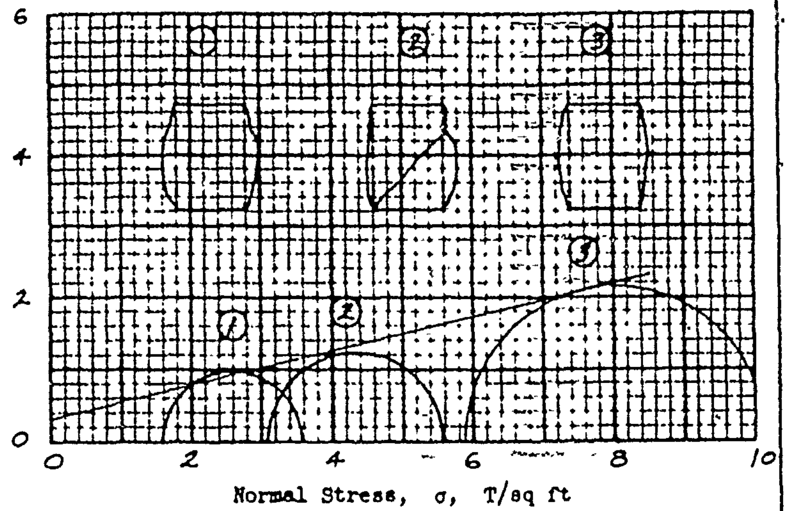
Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain

Project DIERKS DAM	
Area Borrow Material	
Boring No. TP-491 & TP-493	Sample No. M-18,564-C (SSY w-3)
Depth ~~ft~~ 2.0-10.1	Date
TRIAXIAL COMPRESSION TEST REPORT	



APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
10.3°
Composite of minus No. 10 fractions of SWD
Samples M-18,564, -18565, and -18567
DIERKS DAM
SAMPLE NO. M-18,564-C (95%, w-3)
BORING NO. TP-491 & TP-493
DEPTH 20-10.1
EFFECTIVE STRESSES ON 60° PLANES





Test No.			①	②	③	
Initial	Water content	w_o	12.5 %	12.9%	12.9%	%
	Void ratio	e_o	.489	.491	.500	
	Saturation	S_o	69 %	71 %	70 %	%
	Dry density, lb/cu ft	γ_d	112.8	112.6	112.0	
Before Shear	Water content	w_c	17.7 %	17.0%	16.0%	%
	Void ratio	e_c	.477	.457	.430	
	Saturation	S_c	100%	100%	100%	%
	Final back pressure, T/sq ft	u_o	10.72	13.70	12.28	
Final	Water content	w_f	17.7 %	17.0%	16.0%	%
	Void ratio	e_f	.477	.457	.430	
Minor principal stress, T/sq ft		σ_3	1.60	3.10	5.90	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	1.93	2.48	4.26	
Time to failure, min		t_f	188	246	228	
Rate of strain, percent/min			0.08	0.06	0.07	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = 13.1 °

tan ϕ = .233

c = .03 T/sq ft

Method of saturation Back Pressure

☐ Controlled stress

☑ Controlled strain

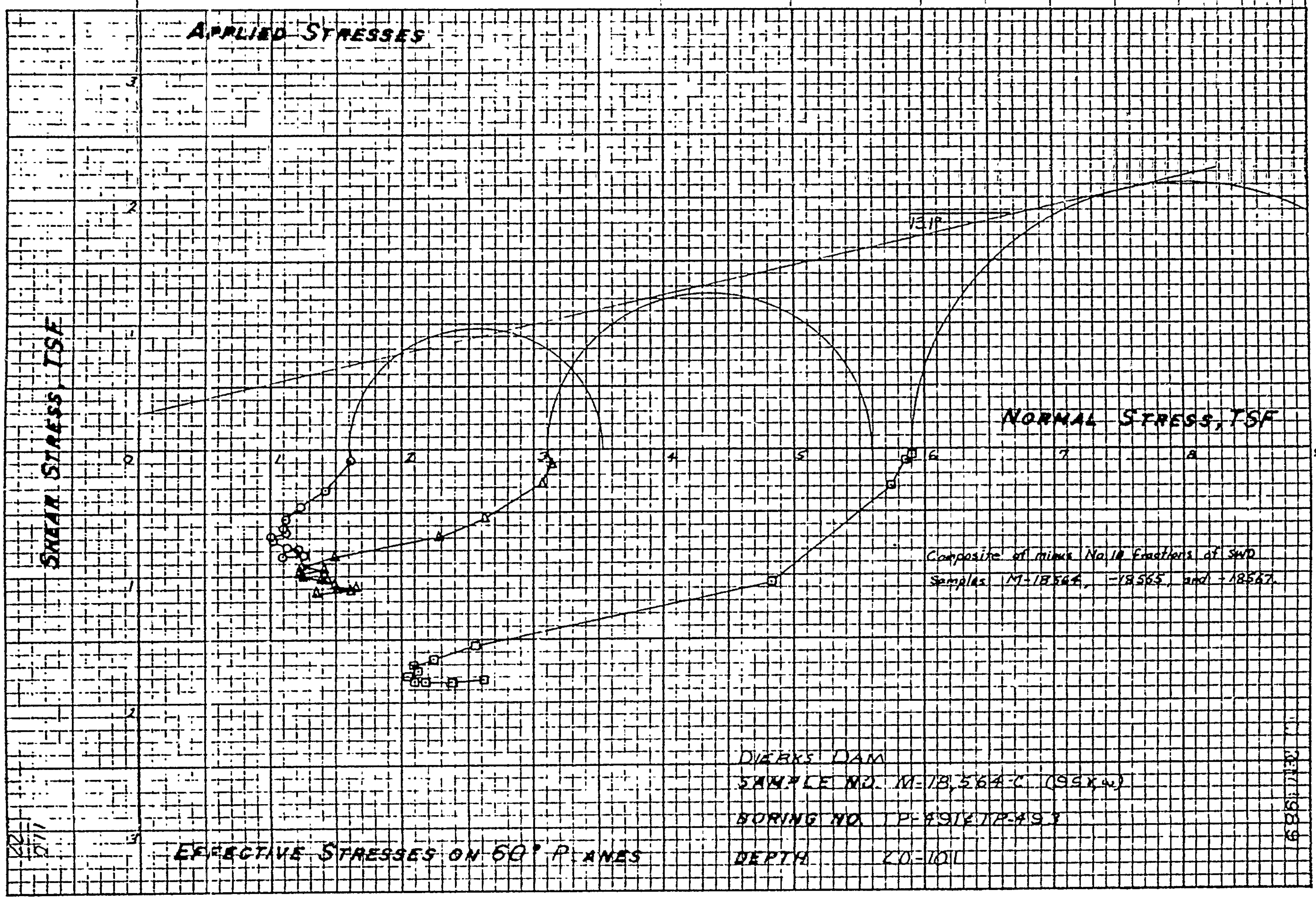
Type of test R	Type of specimen Remold			
Classification CLAY, sandy (CL)		Composite of minus No. 10 fractions of SWD Samples M-18564, -18565, and -18567.		
LL 25	PL 12	PI 13		G_s 2.69

Remarks Major principal stresses are based on maximum deviator stresses at or below 15% strain.

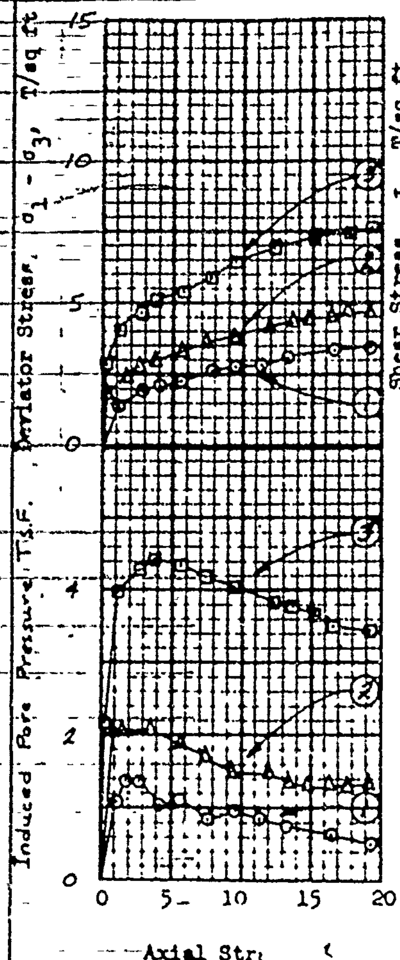
Project DIERKS DAM	
Area Borrow Material	
Boring No. TP-491 & TP-493	Sample No. M-18,564-C (95%, w)
Depth Ft 2.0-10.1	Date [illegible]
TRIAXIAL COMPRESSION TEST REPORT	

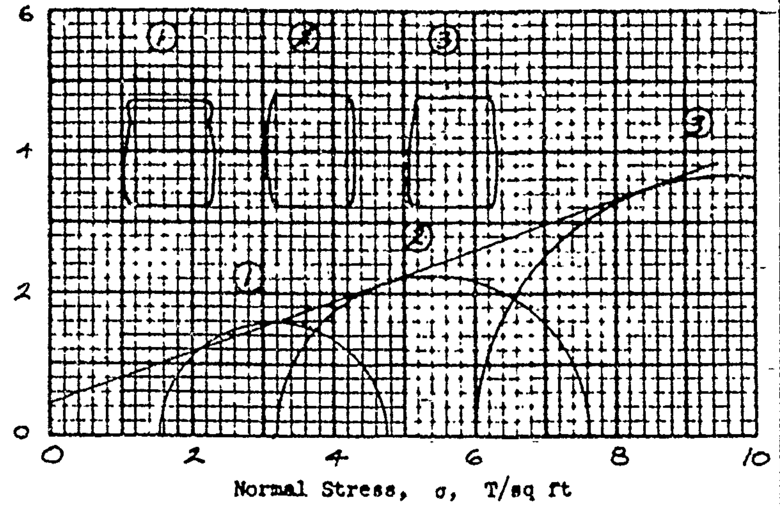
ENG FORM 1 JUN 65 2089— (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

TRANSLUCENT



APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
13.1°
Composite of minus No. 10 fractions of SWD
Samples M-18564, -18565, and -18567.
DIERKS DAM
SAMPLE NO. M-18,564-C (99X4)
BORING NO. P-491 & P-493
DEPTH 20-10L
EFFECTIVE STRESSES ON 60° PLANES





Test No.			①	②	③	
Initial	Water content	w_o	16.0 %	15.9%	15.9 %	%
	Void ratio	e_o	.497	.494	.499	
	Saturation	S_o	87 %	87 %	86 %	%
	Dry density, lb/cu ft	γ_d	112.2	112.4	112.0	
Before Shear	Water content	w_c	15.7 %	14.9%	14.1 %	%
	Void ratio	e_c	.422	.400	.381	
	Saturation	S_c	100 %	100%	100%	%
	Final back pressure, T/sq ft	u_o	7.13	8.92	8.87	
Final	Water content	w_f	15.7 %	14.9%	14.1 %	%
	Void ratio	e_f	.422	.400	.381	
Minor principal stress, T/sq ft		σ_3	1.55	3.20	6.00	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	3.19	4.43	7.30	
Time to failure, min		t_f	216	368	332	
Rate of strain, percent/min			0.07	0.05	0.05	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parame

ϕ = 19.7 °

tan ϕ = .358

c = .04 T/sq ft

Method of saturation

Back Pressure

☐ Controlled stress

☑ Controlled strain

Type of test R | Type of specimen Remolded

Classification *CLAY, sandy (CL)* *Composite of minus No. 10 fractions of SWO Samples M-18564, -18565, and -18567.*

LL 25 | PL 12 | PI 13 | G_s 2.69

Remarks *Major principal stresses are based on maximum deviator stresses at or below 15% strain.*

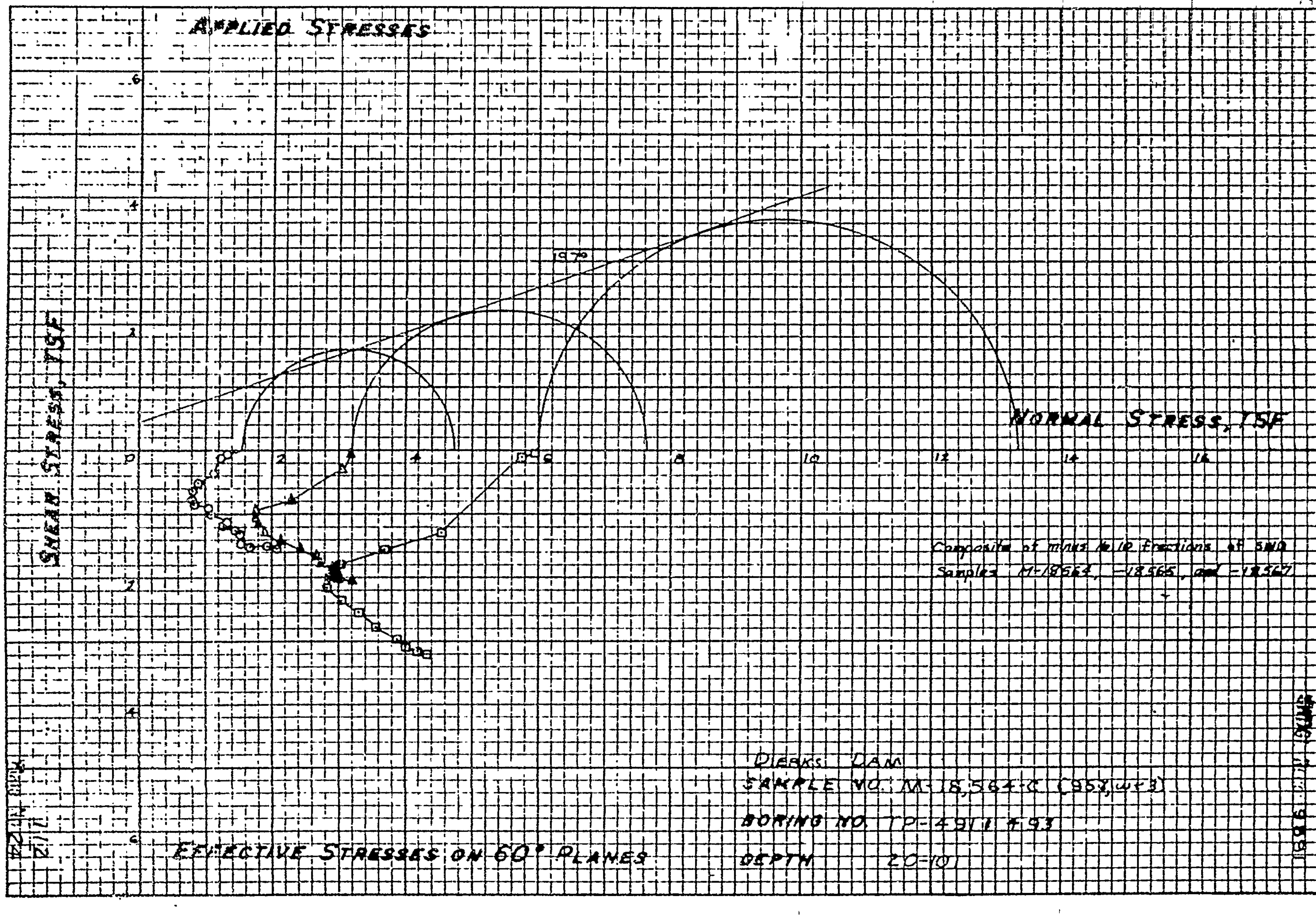
Project *DIERKS DAM*

Area Borrow Material

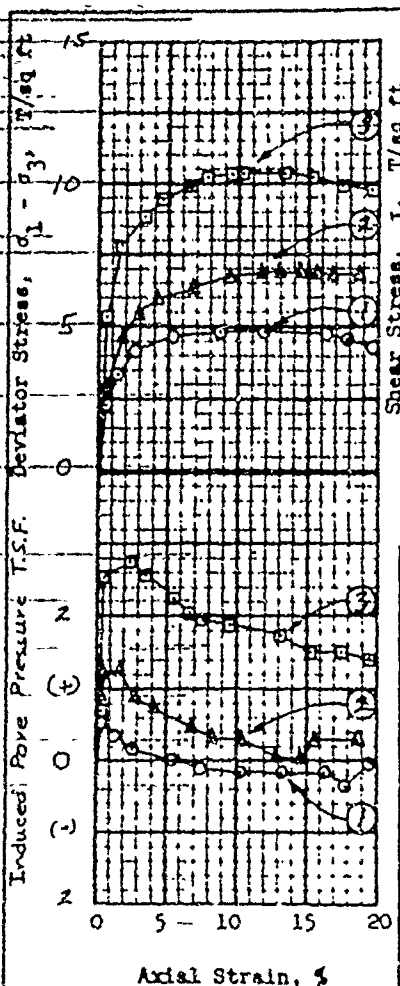
Boring No. *TP-491 & TP-493* Sample No. *(96Y, w+3) M-18,564-C*

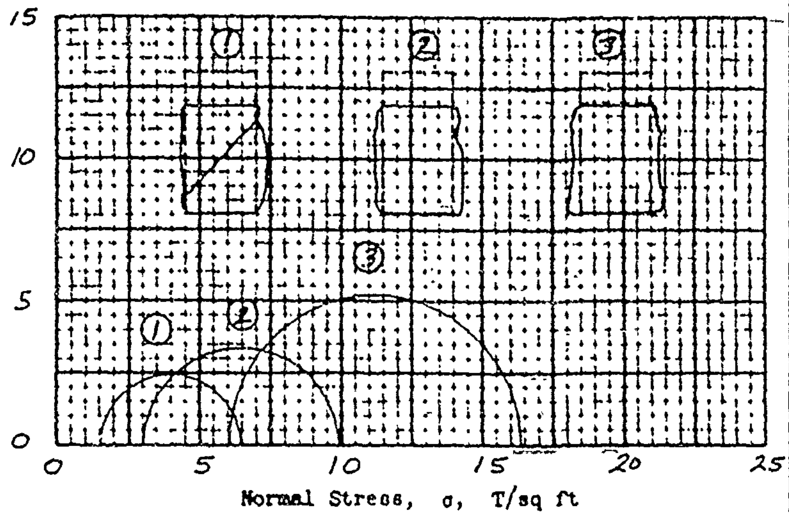
Depth ~~Ft~~ *2.0-10.1* Date

TRIAXIAL COMPRESSION TEST REPORT



APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
0
2
4
6
8
10
12
14
16
18
19.7°
Composite of minus No. 10 fractions of sand
Samples M-18564, -18565, and -18567
DIERKS DAM
SAMPLE NO. M-18,564-C (95%, w+3)
BORING NO. TP-4911 #93
DEPTH 20-10'
EFFECTIVE STRESSES ON 60° PLANES





Test No.			①	②	③	
Initial	Water content	w_o	6.9 %	7.0 %	7.0 %	%
	Void ratio	e_o	.486	.481	.488	
	Saturation	S_o	39 %	39 %	38 %	%
	Dry density, lb/cu ft	γ_d	112.2	112.5	112.1	
Before Shear	Water content	w_c	17.9 %	18.1 %	17.2 %	%
	Void ratio	e_c	.478	.483	.460	
	Saturation	S_c	100 %	100 %	100 %	%
	Final back pressure, T/sq ft	u_o	14.4	13.5	15.1	
Final	Water content	w_f	17.9 %	18.1 %	17.2 %	%
	Void ratio	e_f	.478	.483	.460	
Minor principal stress, T/sq ft		σ_3	1.55	3.00	6.05	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	4.91	6.91	10.35	
Time to failure, min		t_f	208	254	208	
Rate of strain, percent/min			0.06	0.05	0.05	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = ______ °

tan ϕ = ______

c = ______ T/sq ft

Method of saturation ______
Back Pressure

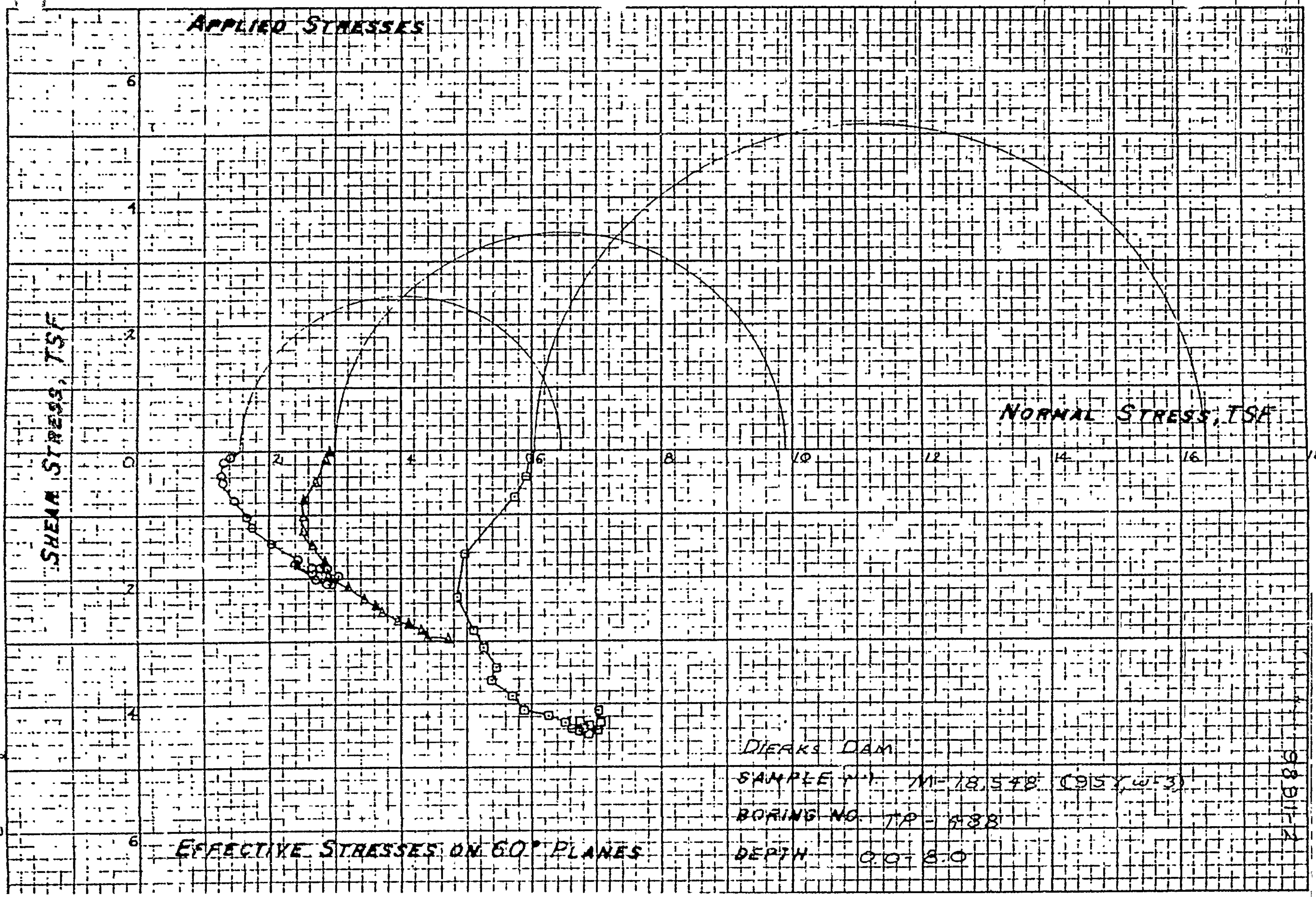
☐ Controlled stress

☑ Controlled strain

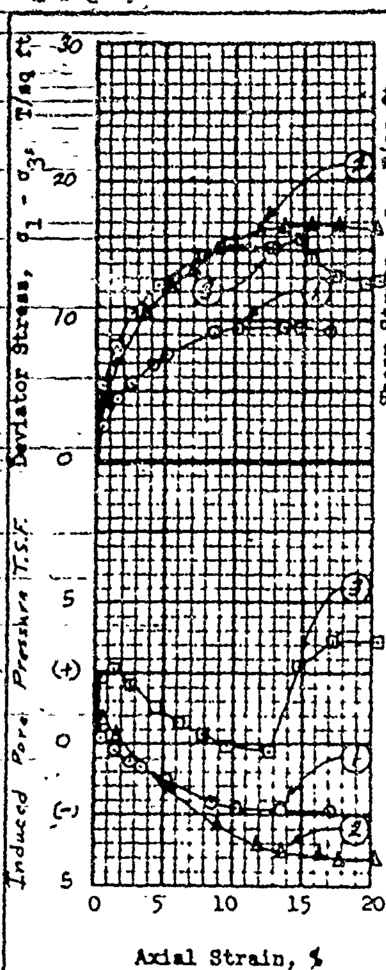
Type of test R	Type of specimen				
Classification	SAND, silty (SM)				
LL NP	PL NP	PI NP		G_s	2.67

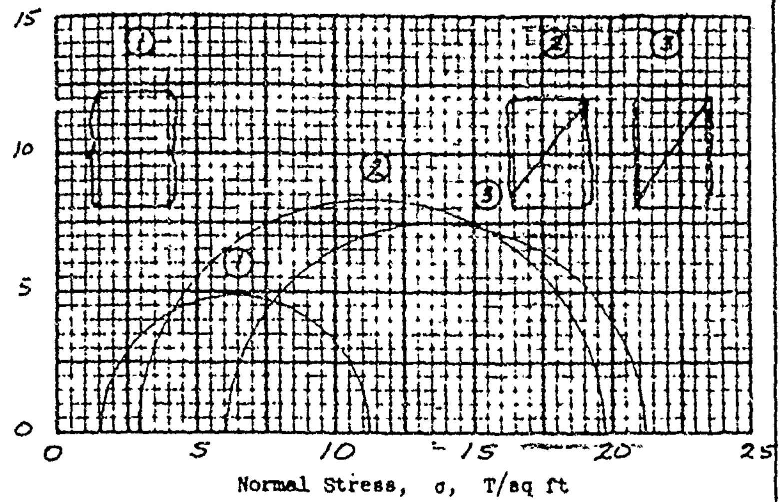
Remarks ______

Project DIERKS DAM	
Area ... Materia	
Boring No. TP-488	Sample No. (95x, w-3) M-18,548
Depth 0.0-8.0	Date JAN 87
TRIAXIAL COMPRESSION TEST REPORT	



APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
SAMPLE M-18,548 (95Y,W-3)
BORING NO. TP-488
DEPTH 0.0-8.0





Test No.			1	2	3	
Initial	Water content	w_o	9.5 %	9.4 %	9.6 %	%
	Void ratio	e_o	.480	.476	.482	
	Saturation	S_o	53 %	53 %	53 %	%
	Dry density, lb/cu ft	γ_d	112.7	112.9	112.5	
Before Shear	Water content	w_c	17.2 %	17.4 %	17.2 %	%
	Void ratio	e_c	.458	.465	.459	
	Saturation	S_c	100 %	100 %	100 %	%
	Final back pressure, T/sq ft	u_o	15.0	14.5	17.8	
Final	Water content	w_f	17.2 %	17.4 %	17.2 %	%
	Void ratio	e_f	.458	.465	.459	
Minor principal stress, T/sq ft		σ_3	1.55	2.90	6.05	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	9.68	16.80	15.19	
Time to failure, min		t_f	395	325	207	
Rate of strain, percent/min			0.04	0.05	0.05	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

ϕ = ________ °

tan ϕ = ________

c = ________ T/sq ft

Method of saturation ________

Back Pressure

☐ Controlled stress

☑ Controlled strain

Type of test *R* | Type of specimen

Classification *SAND, silty (SM)*

LL *NP* | PL *NP* | PI *NP* | G_s *2.67*

Remarks ________

Project *DIERKS DAM*

Area Borrow Material

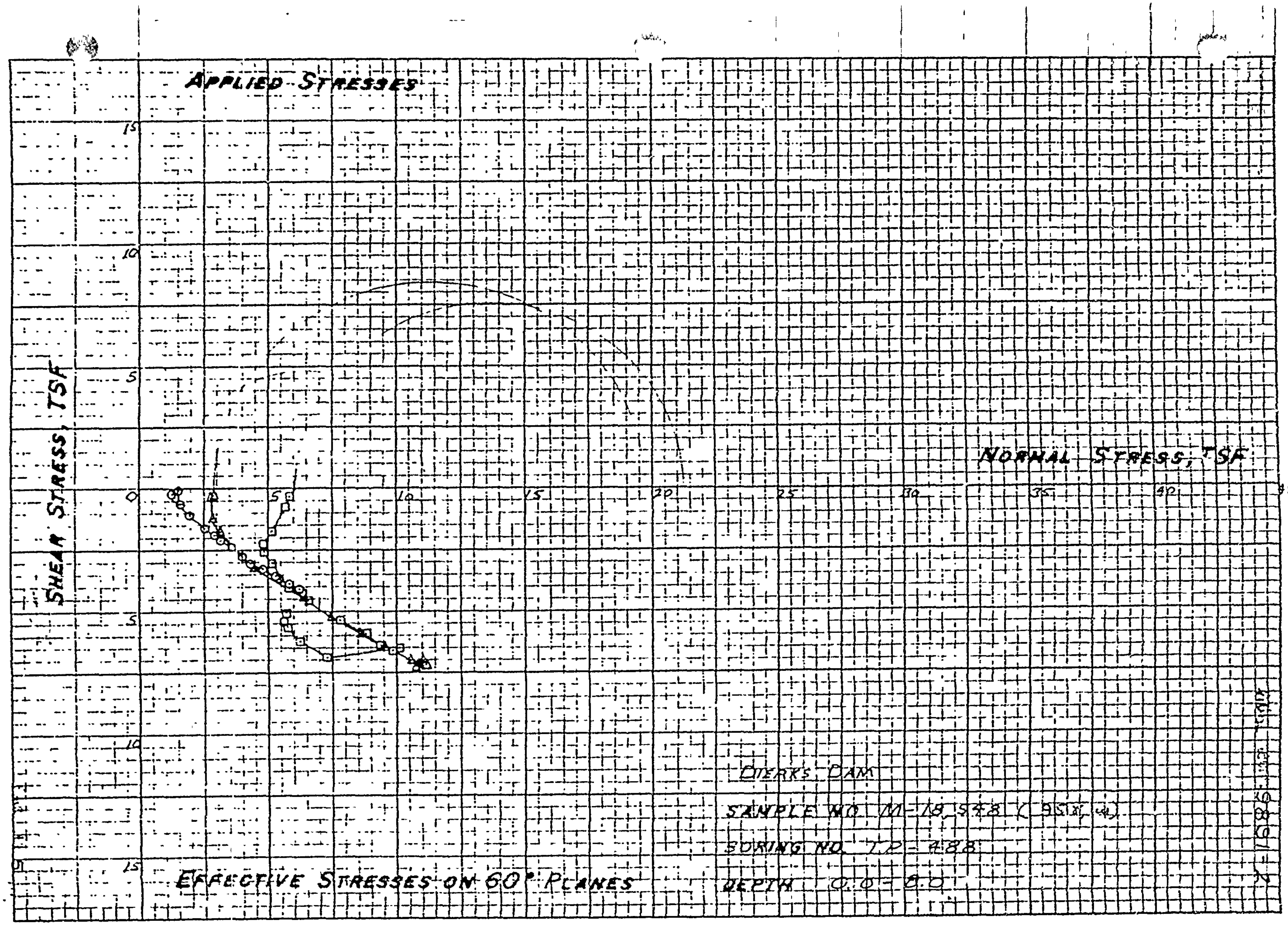
Boring No. *TP-488* | Sample No. *M-18,548* (958 w)

Depth ft *0.0-8.0* | Date JAN

TRIAXIAL COMPRESSION TEST REPORT

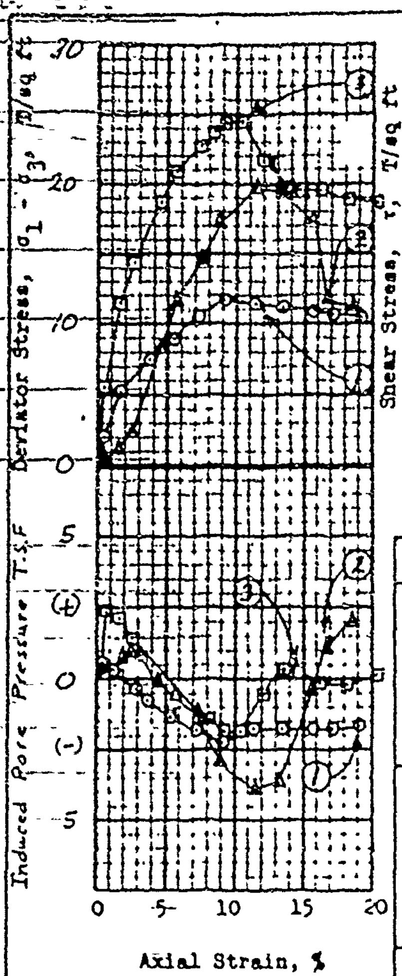
ENG FORM 1 JUN 65 2089 (EM 1110-2-1902) PREVIOUS EDITIONS ARE OBSOLETE

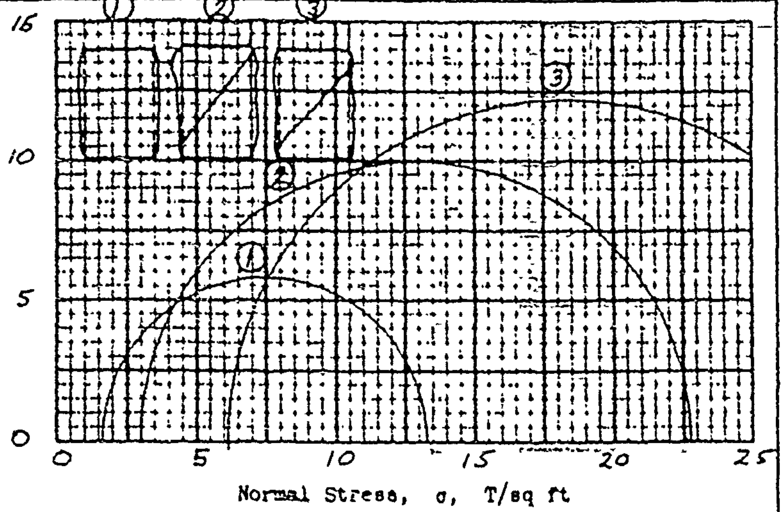
TRANSLUCENT



APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
0
5
10
15
20
25
30
35
40
45
DIERKS DAM
SAMPLE NO. M-18,548 (95X-4)
BORING NO. TP-488
DEPTH 0.0-8.0
EFFECTIVE STRESSES ON 60° PLANES

9891-2





	Test No.		1	2	3	
Initial	Water content	w_o	14.4%	14.9%	13.9%	%
	Void ratio	e_o	.506	.509	.509	
	Saturation	S_o	76 %	78 %	73 %	%
	Dry density, lb/cu ft	γ_d	110.7	110.4	110.4	
Before Shear	Water content	w_c	16.7 %	17.1 %	16.8%	%
	Void ratio	e_c	.445	.458	.448	
	Saturation	S_c	100 %	100 %	100 %	%
	Final back pressure, T/sq ft	u_o	10.9	9.8	15.0	
Final	Water content	w_f	16.7%	17.1 %	16.8%	%
	Void ratio	e_f	.445	.458	.448	
Minor principal stress, T/sq ft		σ_3	1.60	3.00	6.10	
Max deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{max}$	11.72	19.74	24.35	
Time to failure, min		t_f	169	278	220	
Rate of strain, percent/min			0.05	0.04	0.05	
Ult deviator stress, T/sq ft		$(\sigma_1-\sigma_3)_{ult}$				
Initial diameter, in.		D_o	1.4	1.4	1.4	
Initial height, in.		H_o	3.0	3.0	3.0	

Shear Strength Parameters

φ = ________ °

tan φ = ________

c = ________ T/sq ft

Method of saturation ________

Back Pressure

☐ Controlled stress

☑ Controlled strain

Type of test R	Type of specimen	
Classification SAND, silty (SM)		
LL NP	PL NP	PI NP	G_s 2.67

Remarks

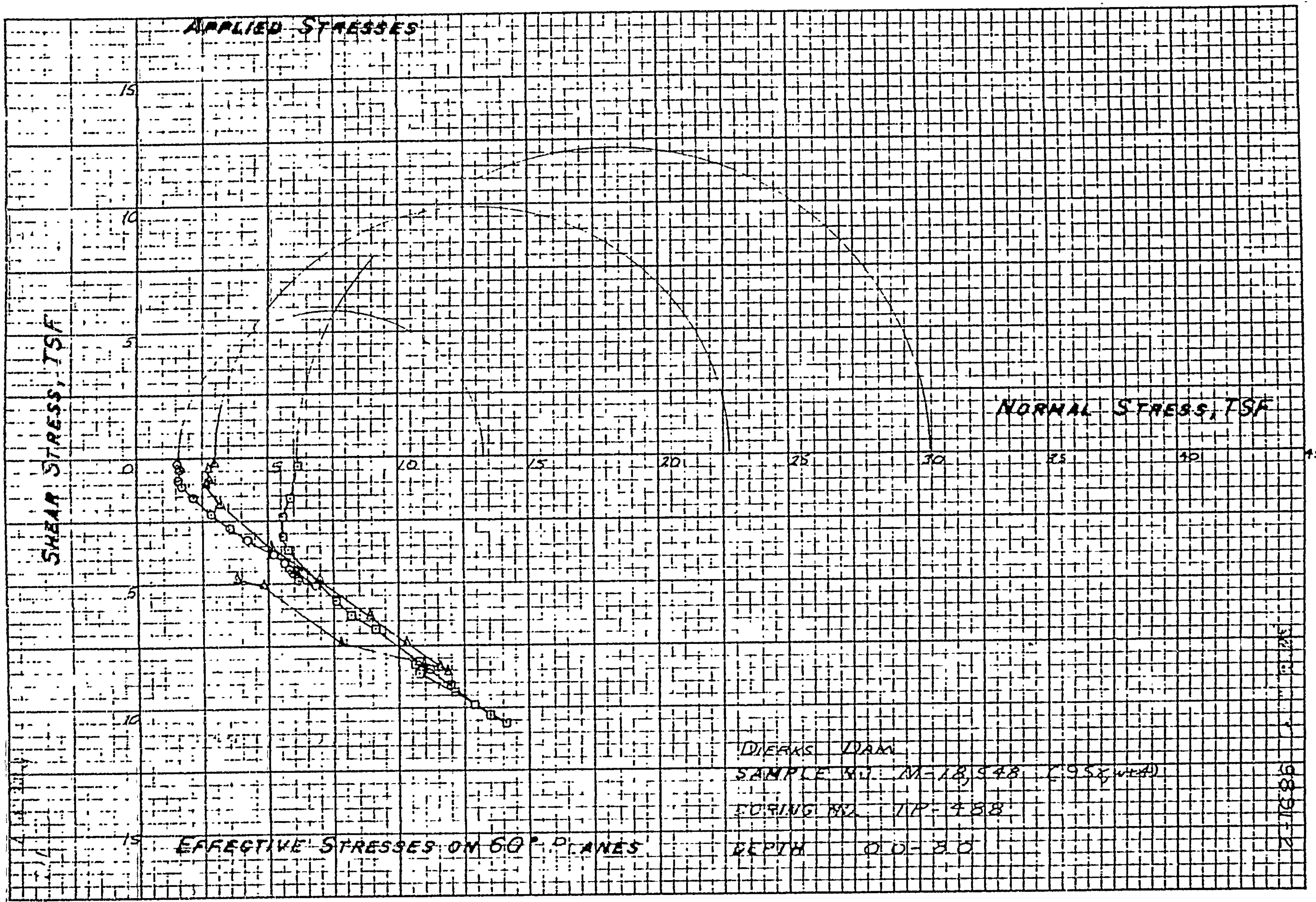
Project DIERKS DAM

Area Borrow Material

Boring No. TP-488 | Sample No. M-18,548 (95%, ω+4)

Depth ft 0.0 - 8.0 | Date

TRIAXIAL COMPRESSION TEST REPORT

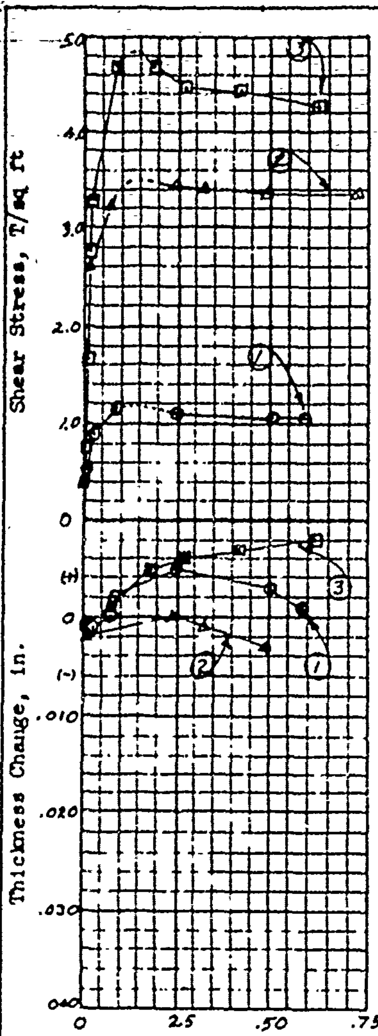


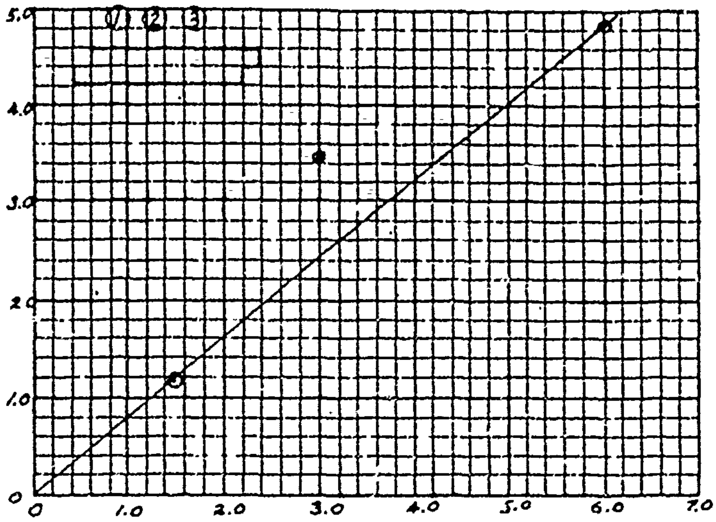
APPLIED STRESSES
SHEAR STRESS, TSF
NORMAL STRESS, TSF
EFFECTIVE STRESSES ON 60° PLANES
DIERKS DAM
SAMPLE NO. M-18,548 (9.5% wt.4)
BORING NO. IP-488
DEPTH 0.0-8.0

APPENDIX E

COMPACTED MATERIALS

SECTION 3. DIRECT SHEAR TESTS





Test No.			①	②	③	
Initial	Water content	w_o	14.7 %	14.7 %	14.7 %	%
	Void ratio	e_o	.503	.508	.507	
	Saturation	S_o	78 %	77 %	77 %	%
	Dry density lb/cu ft	γ_d	110.8	110.6	110.7	
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}	–	–	4	
Final	Water content	w_f	15.5 %	15.7 %	14.4 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	700	700	700	
Normal stress T/sq ft		σ	1.5	3.0	6.0	
Maximum shear strength, T/sq ft		τ	1.17	3.47	4.85	

Shear Values

ø' = 39.0°

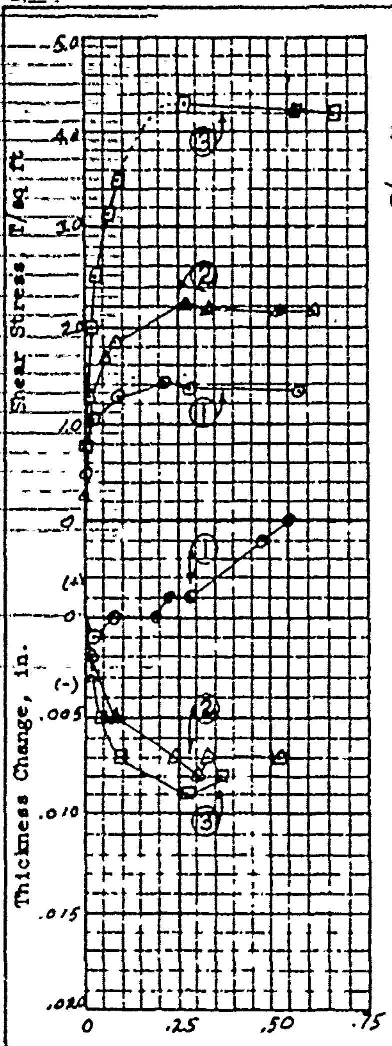
tan ø' = .808

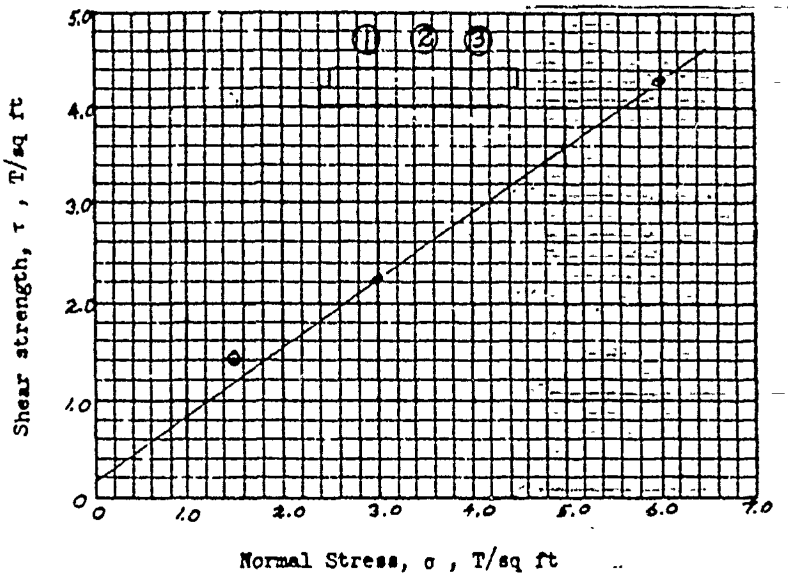
c' = 0.0

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain .0002 in./min.

Type of Specimen Remolded	3.0 in. Square	0.5 in. Thickness	
Classification CLAY, sandy (CL-ML)			
LL 21	PL 15	PI 6	~~D10~~ G_s 2.67

Remarks	Project Dierks Dam
	Area Borrow Material
	Boring No. 8A-200 / Sample No. M-12,496 (958,443)
	Depth ft 0.0 - 3.0 / Date NOV 65
	DIRECT SHEAR TEST REPORT





Test No.			①	②	③	
Initial	Water content	w_o	15.9 %	15.9 %	15.9 %	%
	Void ratio	e_o	.519	.526	.517	
	Saturation	S_o	82 %	81 %	83 %	%
	Dry density lb/cu ft	γ_d	110.6	110.0	110.7	
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}	—	—	1	
Final	Water content	w_f	16.4 %	15.4 %	14.4 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	1600	1500	1000	
Normal stress T/sq ft		σ	1.5	3.0	6.0	
Maximum shear strength, T/sq ft		τ	1.40	2.22	4.29	

Shear Values

φ' = 34.6°

tan φ' = .690

c' = 0.2

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain .0002 in./min.

Type of Specimen Remolded	3.0 in. Square	0.5 in. Thickness

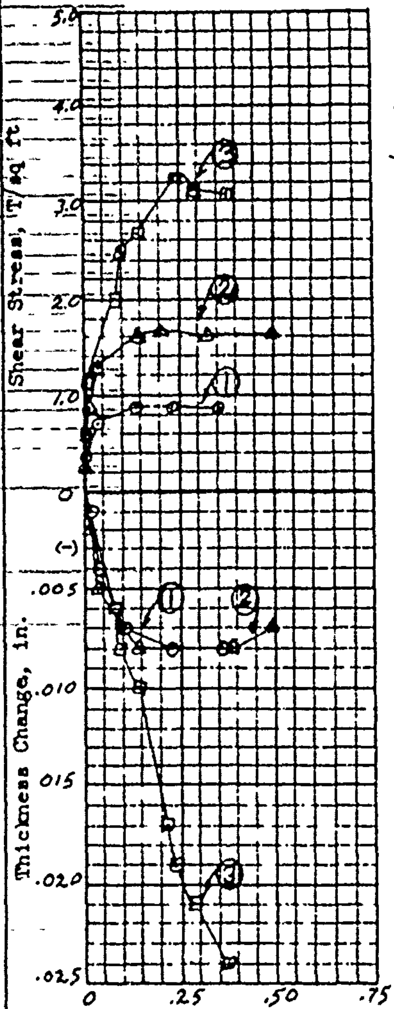
Classification CLAY (CL)

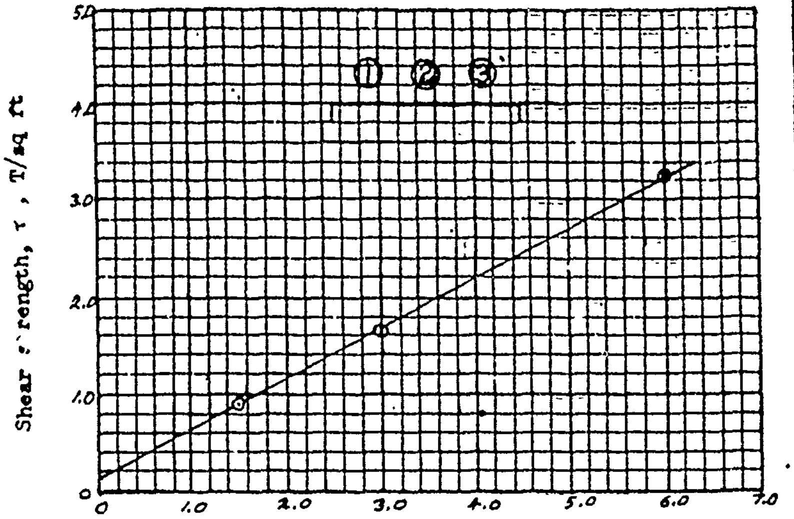
LL 30	PL 14	PI 16	~~D10~~ Gs 2.69

Remarks	Project Dierks Dam	
	Area Borrow Material	
	Boring No. 8A-203	Sample No. M-12,500 (958, W+3)
	Depth ~~El~~ 0.0 - 3.0	Date NOV 65
	DIRECT SHEAR TEST REPORT	

ENG FORM 2092 1 MAY 63 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT)

C 3437





Test No.			①	②	③	
Initial	Water content	w_o	19.9 %	19.9 %	19.9 %	%
	Void ratio	e_o	.672	.672	.672	
	Saturation	S_o	80 %	80 %	80 %	%
	Dry density lb/cu ft	γ_d	101.2	101.2	101.2	
Void ratio after consolidation		e_c				
Time for 50% consolidation, min		t_{50}	—	—	1	
Final	Water content	w_f	20.6 %	18.9 %	19.0 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Actual time to failure, min.		t_f	2300	1800	3600	
Normal stress T/sq ft		σ	1.5	3.0	6.0	
Maximum shear strength, T/sq ft		τ	0.90	1.64	3.22	

Shear Values

φ' = 27.3°

tan φ' = .516

c' = 0.1

Test Type (Check One) ☐ Controlled, stress ☑ Controlled, strain .0001 in./min.

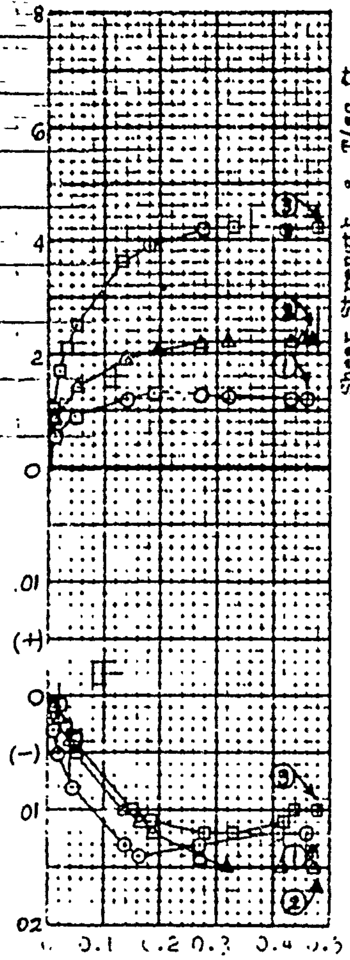
Type of Specimen Remolded	3.0 in. Square	0.5 in. Thickness

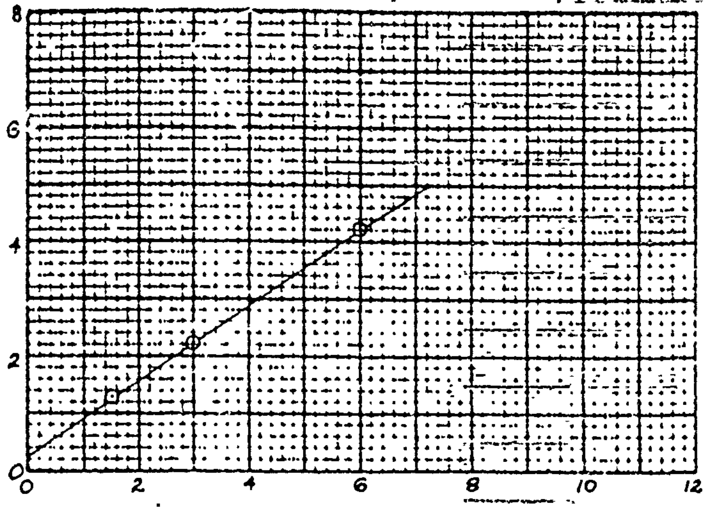
Classification CLAY (CL)

LL 40	PL 13	PI 27	G_s 2.71

Remarks	Project Dierks Dam	
	Area Borrow Material	
	Boring No. 8A-207	Sample No. (95δ, W+3) M-12,504
	Depth 5.0 - 6.5	Date NOV 65
	DIRECT SHEAR TEST REPORT	

ENG FORM 1 MAY 63 2092 PREVIOUS EDITIONS ARE OBSOLETE. (TRANSLUCENT) C 3437





Shear Strength Parameters

φ' = 33.4 °

tan φ' = .660

c' = 0.3 T/sq ft

Controlled stress

✓ Controlled strain

Test No.			①	②	③	
Initial	Water content	w_o	17.9 %	17.8 %	17.8 %	%
	Void ratio	e_o	.554	.554	.552	
	Saturation	S_o	87 %	86 %	86 %	%
	Dry density, lb/cu ft	γ_d	107.7	107.7	107.8	
Void ratio after consolidation		e_c				
Time for 50 percent consolidation, min		t_{50}				
Final	Water content	w_f	17.1 %	16.0 %	14.5 %	%
	Void ratio	e_f				
	Saturation	S_f	%	%	%	%
Normal stress, T/sq ft		σ	1.5	3.0	6.0	
Maximum shear stress, T/sq ft		τ_{max}	1.30	2.24	4.22	
Actual time to failure, min		t_f	2000	3100	3800	
Rate of strain, in./min			0.0001	0.00015	0.0001	
Ultimate shear stress, T/sq ft		τ_{ult}				

Type of specimen | 3.0 in. square | 0.5 in. thick

Classification SAND, clayey (SC)

LL 31	PL 13	PI 18		G_s 2.68

Remarks

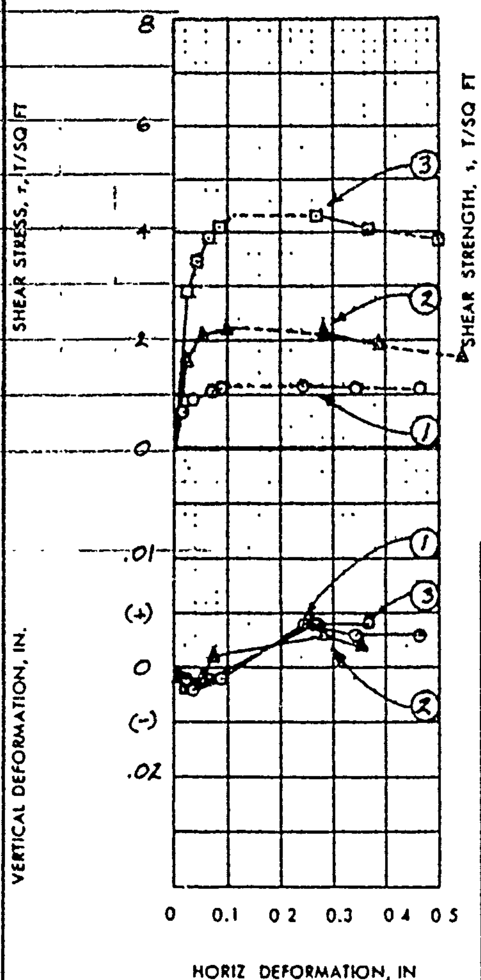
Project Dierks Dam

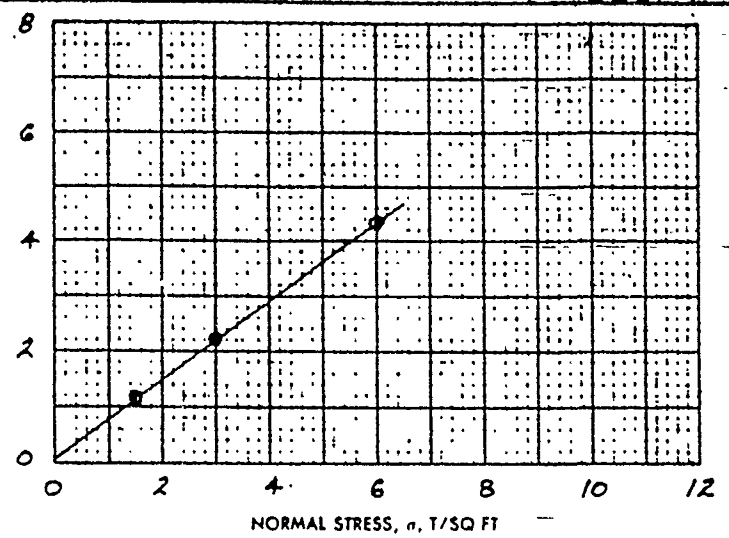
Area

Boring No. 10A-2C-169 | Sample No. (95 % (w+3)) M-17,973

Depth 10 - 33 | Date

DIRECT SHEAR TEST REPORT





SHEAR STRENGTH PARAMETERS

φ 35.3°

TAN φ .707

c .01 T/SQ FT

☐ CONTROLLED STRESS

☑ CONTROLLED STRAIN

TEST NO			①	②	③	
INITIAL	WATER CONTENT	w_o	10.3%	10.3%	10.3%	%
	VOID RATIO	e_o	.492	.492	.491	
	SATURATION	S_o	56 %	56 %	56 %	%
	DRY DENSITY, LB/CU FT	γ_o	111.7	111.7	111.8	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION, MIN		t_{50}				
FINAL	WATER CONTENT	w_f	14.8%	14.4%	14.8%	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS, T/SQ FT		σ	1.5	3.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.16	2.21	4.33	
ACTUAL TIME TO FAILURE MIN		t_f	500	600	600	
RATE OF STRAIN IN /MIN			0.0002	0.0002	0.0002	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

TYPE OF SPECIMEN Remolded 3.0 IN SQUARE 0.5 IN. THICK

CLASSIFICATION SAND, silty (SM)

LL NP PL NP PI NP G_s 2.67

REMARKS

PROJECT DIERKS DAM

AREA

BORING NO. TP-488 SAMPLE NO (95Y) M-18,548

DEPTH EL 0.0-8.0 DATE 58

DIRECT SHEAR TEST REPORT

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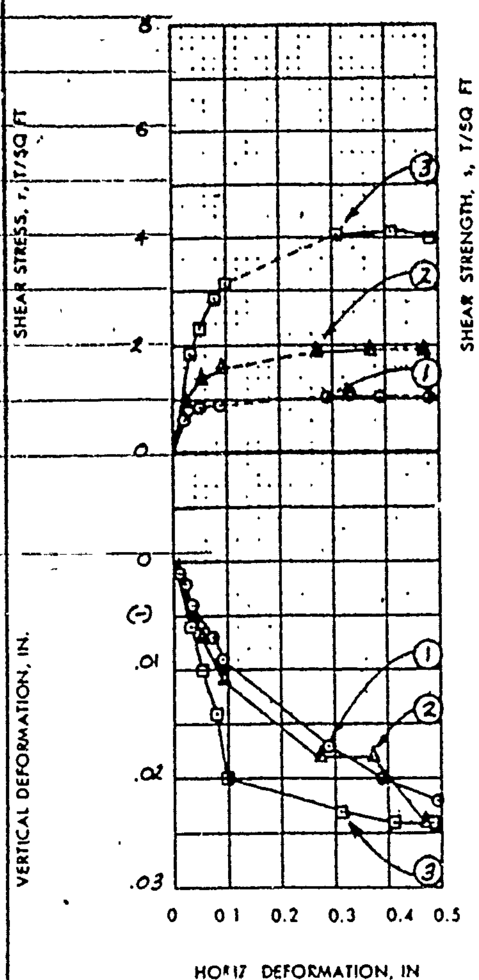
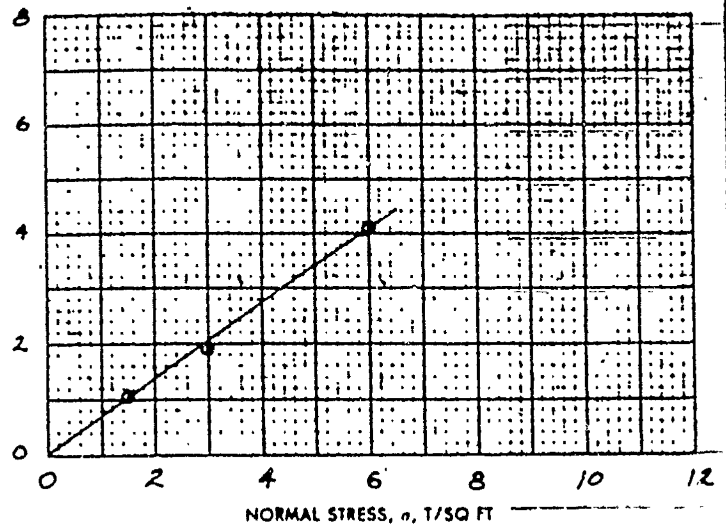
ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO 1966 OF-214-945

PLATE IX-3





TEST NO			1	2	3	
INITIAL	WATER CONTENT	w_o	12.5 %	12.5 %	12.7 %	%
	VOID RATIO	e_o	.490	.494	.495	
	SATURATION	S_o	69 %	68 %	69 %	%
	DRY DENSITY, LB/CU FT	γ_d	112.7	112.4	112.3	
VOID RATIO AFTER CONSOLIDATION		e_c				
TIME FOR 50 PERCENT CONSOLIDATION MIN		t_{50}				
FINAL	WATER CONTENT	w_f	14.6 %	13.7 %	12.2 %	%
	VOID RATIO	e_f				
	SATURATION	S_f	%	%	%	%
NORMAL STRESS T/SQ FT		σ	1.5	3.0	6.0	
MAXIMUM SHEAR STRESS, T/SQ FT		τ_{max}	1.04	1.92	4.11	
ACTUAL TIME TO FAILURE, MIN		t_f	1600	2000	2000	
RATE OF STRAIN, IN/MIN			0.0002	0.0002	0.0002	
ULTIMATE SHEAR STRESS, T/SQ FT		τ_{ult}				

SHEAR STRENGTH PARAMETERS

φ = 34.3°

TAN φ = .682

c = 0.0 T/SQ FT

☐ CONTROLLED STRESS

☑ CONTROLLED STRAIN

TYPE OF SPECIMEN Remolded — 3.0 IN. SQUARE — 0.5 IN. THICK

CLASSIFICATION CLAY, sandy (CL)

LL 25 | PL 12 | PI 13 | G_s 2.69

REMARKS

PROJECT Dierks Dam

AREA Borrow M[illegible]

BORING NO TP-491/TR493 SAMPLE NO M-18,564-C (9SY,w)

DEPTH ft 2.0-10.1 DATE NOV 68

DIRECT SHEAR TEST REPORT

ENG FORM 1 JUN 65 2092 (EM 1110-2-1906) PREVIOUS EDITIONS ARE OBSOLETE (TRANSLUCENT)

GPO 1966 OF—214-945

APPENDIX F

MONTHLY SUMMARIES OF COMPACTION AND WATER CONTENT TESTS

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(1) Periodic SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT:	REPORT NO.
Dierks Dam, Cofferdam + RT. Embank.	RIVER: Saline; STATE: Ark.; TOWN: Dierks	DACW-56-C-71-0159	Amis Const. Co.	4-23-71	1; SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
D/S Random	95	±3	SFR / VT	12	4	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 12)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCM MAX DRY DENSITY (PCF) (COL 23)	RCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-1	9-28-70	WV	5+50	℄	455	6	D/S Cofferdam	Diversion Channel	Tan SM(E)								108.0	9.8				120.0	9.8	0	90	Area given add. rolling
R-1A	"	"	4+80	10'RT	"	"	"	"	"								118.1	12.5				"	"	+2.7	98	Recheck
R-2	9-30-70	"	5+25	12'RT	456	"	"	"	"								110.1	9.3				"	"	-0.5	92	Area given add. rolling
R-2A	10-1-70	"	"	"	"	"	"	"	"								114.4	8.1				"	"	-1.7	95	Recheck
R-3	10-5-70	"	3+65	10'RT	459	"	"	"	"								117.9	9.7				"	"	-0.1	98	
R-4	10-21-70	"	7+50	℄	466	"	"	"	Tan SM-SC (E)								116.0	14.1				116.6	13.3	+0.8	99	No corrective action necessary. Started raining
R-5	11-13-70	"	0+25	℄	453	"	U/S Cofferdam	"	"								115.4	11.6				117.5	15.0	-3.4	98	
R-6	11-16-70	"	3+20	8'RT	452	"	"	"	"								118.6	15.3				"	"	+0.3	101	
R-7	11-17-70	"	1+25	℄	455	"	"	"	Tan SM(E)								124.1	10.0				124.7	9.7	+0.3	100	
R-8	11-19-70	"	0+75	℄	470	"	"	"	"								117.3	14.4				117.5	15.0	-0.6	100	
R-9	3-1-71	"	5+10	400'RT	"	"	RT. Emb.	N. Ridge Spillway	"								113.8	12.0				117.7	14.8	-2.8	97	
R-10	3-12-71	"	4+75	275'RT	473	"	"	"	Red SC(E)								109.3	15.3				111.4	16.7	-1.4	98	

Note: When embankment construction begins in ernest, reports will be made monthly.

A gradation test was ~~and~~ inadvertantly omitted on test R-10

NOTES: (1) FILL IN APPROPRIATE WORD DAILY WEEKLY, MONTHLY OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED E G: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E G: AREA C SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NE UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21 22 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E G 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E G FOR COL 16 + COL 21 OR COL 23 INDICATE BY A OR B RESPECTIVELY FOR COL 18 + COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ____

CORPS OF ENGINEERS

PREPARED BY: RHRogan

SUBMITTED BY: ____

RESIDENT ENGINEER

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO :
Dierks Dam	RIVER. Saline STATE: Ark. TOWN Dierks	DACW 56-C-71-0159	Amis Const. Co.	10-4-71	2 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ——— 3-4 ——— 5— 6-7 ——— 8-9 ——— 10-13 ———

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Random	95	± 3	SFR	12	8	
			VT	12	4	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	- #3/4 FRACTION DRY DENSITY (PCF) (COL 18)	- #3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX. DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-11	6-17-71	WV	2+50	100' LT	490	12	RT. Emb	N. Ridge Spillway	Tan SM (E)								112.2	19.5				116.8	19.7	-0.2	96	watered & reworked
R-12	"	"	3+10	300' RT	485	"	"	"									123.0	11.1				128.8	14.1	-3.0	96	"
R-13	6-22	"	4+50	280' RT	"	"	"	"									118.4	5.8				124.9	9.0	-3.2	95	reduced lifts
R-14	6-24	"	5+25	250' RT	487	"	"	"	Tan SC(E)								103.0	18.0				110.5	18.3	-0.3	93	additional rolling
R-15	"	"	4+75	"	"	"	"	"	"								105.6	19.1				"	"	+0.8	96	
R-16	6-30	"	5+50	300' RT	496	"	"	"	Tan SM-SC(E)								109.4	16.9				111.7	18.4	-1.5	98	
R-17	"	"	4+50	275' RT	"	"	"	"	Tan SC(E)								105.4	17.8				"	"	-0.4	95	

NOTES: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER______( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AX'S
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 + COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 + COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER ______

CORPS OF ENGINEERS

PREPARED BY: RWRogers

SUBMITTED BY: ______

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1967 — [illegible]

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT.	REPORT NO:
Dierks Dam	River: Saline State: Ark Town: Dierks	DACW 56-C-71-0159	Amis Const. Co.	10-4-71	2 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ———— 6-7 ————
3-4 ———— 8-9 ————
5— ———— 10-13 ————

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core RT Emb.	95	+2% -1%	SFR	12	8	

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	−3/4" FRACTION DRY DENSITY (PCF)	−3/4" FRACTION WATER CONTENT (%)	STANDARD METHOD TEST	STANDARD METHOD MAX DRY DENSITY (PCF)	STANDARD METHOD OPT WATER CONTENT (%)	RCCM MAX DRY DENSITY (PCF)	RCCM OPT WATER CONTENT (%)	W % + OR −	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-1	6-4-71	WV	2+82	℄	480±	12	RT Emb Impervious	Area E	Red CL (E)			72	54.3				101.9	17.6				105.4	19.4	-1.8	97	watered + reworked
I-1A	6-10-71	"	2+85	℄	482	"	"	"	"								110.0	18.7				"	"	-0.7	104	Recheck
I-2	"	"	3+15	℄	484	"	"	"	"								105.5	20.6				"	"	+1.2	100	
I-3	6-15-71	"	2+50	℄	489	"	"	"	"								107.2	17.0				108.2	17.6	-0.6	99	
I-4	6-21-71	"	2+35	10'Lt	495	"	"	"	"								108.1	17.7				"	"	+0.1	100	
I-5L	6-28-71	"	3+80	℄	499	"	"	"	"								104.4	17.8				109.7	18.4	-0.6	95	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E G : SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (C) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ________ ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E G : AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD. (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E G FOR COL 16 + COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 + COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER ________

CORPS OF ENGINEERS

PREPARED BY: C M Rogers

SUBMITTED BY: ________

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1967 O-266-021 (81)

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT: Dierks Dam | RIVER: Saline | STATE: Ark | TOWN: Dierks | CONTRACT NO: DAWC 56-C-71-0159 | CONTRACTOR: Amis Const. Co. | DATE OF REPORT: 10-4-71 | REPORT NO.: 3 | SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Random	95	±3%	SFR	12	8	
			VT	12	4	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX. DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-18	7-1-71	WV	4+50	270'RT	499	12	RT. Emb. Random	N. Ridge Spillway									111.0	18.5				113.8	15.4	+3.1	98	Disced + rerolled
R-19	"	"	5+25	150'RT	501	"	"	"									116.9	15.1				"	"	-0.3	103	
R-20	7-7-71	"	4+60	285'RT	504	"	"	"									116.5	11.6				120.8	12.2	-0.6	97	
R-21	"	"	5+25	200'RT	504	"	"	"									121.8	13.4				"	"	+1.2	101	
R-22	7-8-71	"	3+65	110'RT	507	"	"	"									119.0	11.7				118.9	12.7	-1.0	100	
R-23	"	"	2+25	50'LT	510	"	"	"									121.1	13.0				120.1	15.1	-2.1	101	
R-24	7-9-71	"	4+75	300'RT	508	"	"	"									98.4	13.3				111.2	13.9	-0.6	89	Ripped up reworked
R-24A	7-13-71	"	4+75	275'RT	505	"	"	"									109.4	16.5				109.7	18.2	-1.7	100	Recheck
R-25	"	"	4+50	80'RT	511	"	"	"									108.1	18.0				"	"	-0.2	99	
R-26	7-15-71	"	3+75	150'RT	512	"	"	"									113.4	9.1				119.6	11.6	-2.5	95	
R-27	7-19-71	"	2+20	60'LT	518	"	"	"									119.8	15.0				115.6	15.2	-0.2	104	
R-28	7-23-71	"	4+50	190'RT	520	"	"	"									100.9	17.1				114.8	16.8	+0.3	88	
R-28A	7-27-71	"	"	"	"	"	"	"									119.8	15.2				120.6	14.4	+0.8	99	Recheck

NOTES: (a) FILL IN APPROPRIATE WORD DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: RWLogan
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT.	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT.	REPORT NO.
Dierks Dam	RIVER Saline STATE Ark TOWN Dierks	DACW 56-C-71-0159	Amis Const. Co.	10-4-71	3 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1–2 ____ 3–4 ____ 5– ____ 6–7 ____ 8–9 ____ 10–13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Impervious	95	+3% -1%	SFR	12	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-#3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	MAX DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-6	7-7-71	NV	4+00	℄	506	12	RT Emb. Impervious	Area E	Red CL (E)								112.1	18.0				108.2	17.6	+0.4	104	
I-7	7-14-71	"	3+00	℄	512	"	"	"	"			70.3	32.7				117.2	11.0				119.2	13.2	-2.2	98	Ripped up, watered, Rerolled
I-8	7-15-71	"	2+80	℄	514	"	"	"	"								108.2	13.6				"	"	+0.4	91	Rerolled
I-8A	"	"	2+85	℄	514	"	"	"	"								118.1	14.1				"	"	+0.9	99	Recheck
I-9	7-19-71	"	4+00	3' RT	521	"	"	"	"								117.1	14.3				113.5	16.6	-2.3	103	Ripped up watered Rerolled
I-10	7-21-71	"	3+90	3' LT	523	"	"	"	"								108.9	16.1				"	"	-0.5	96	
I-11L	7-23-71	"	2+00	℄	523	"	"	"	Red CL			77.2	38.1				101.1	12.8				112.5	13.5	-0.7	90	
I-11A	7-27-71	"	"	"	"	"	"	"	"								116.1	14.6				115.5	14.9	-0.3	101	Recheck

NOTE. (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER______( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E G: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E G 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E G FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: R.W. Rogers

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1967 [illegible]

(MAIN FORM)

(2) ______ SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO:
Dierks Dam	RIVER Saline STATE Ark TOWN Dierks	DAWC-56-C-71-0159	AMIS Const. Co.	10-4-71	4 SHEET 1 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR	EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
1-2 ___ 6-7 ___ 3-4 ___ 8-9 ___ 5 ___ 0-13 ___	RT. Emb. Random	95	±3%	SFR	12	8	
				VT	12	4	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4" FRACTION DRY DENSITY (PCF) (COL 18)	-3/4" FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	MAX DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	w % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-29	8-2-71	WY	4+25	180'RT	530	12	RT Emb. Random	N. Ridge Spillway	Tan SM (E)								116.1	15.8				119.5	14.9	+0.9	97	
R-30	8-3-71	"	5+00	120'RT	"	"	"	"	"								118.3	12.8				118.1	13.8	-1.0	100	
R-31	8-4-71	"	1+80	50'LT	"	"	"	"	"								112.3	10.7				117.9	13.1	-2.4	95	
R-32	8-5-71	"	3+18	"	"	"	"	"	"								115.5	15.8				112.2	15.8	±0	103	
R-33	8-16-71	"	5+00	155'RT	532	"	"	"	"								108.0	11.1				123.5	12.6	-1.5	88	Watered Rerolled
R-33A	8-19-71	"	"	100'RT	533	"	"	"	"								116.0	12.2				121.0	12.6	-0.4	96	Recheck
R-34	8-16-71	"	3+00	120'RT	535	"	"	"	"								120.0	11.5				121.6	12.5	-1.0	99	
R-35	8-17-71	"	3+75	50'RT	533	"	"	"	Tan GM(E)								114.9	12.6				118.1	14.4	-1.8	97	
R-36	"	"	3+50	78'LT	530	"	"	"	"								118.0	14.8				120.0	13.9	+0.9	98	
R-37	8-18-71	"	1+60	50'LT	531	"	"	"	Tan SM (E)								118.5	15.7				116.6	15.9	-0.2	102	
R-38	8-19-71	"	3+18	75'LT	533	"	"	"	Tan GC (E)								112.0	11.1				117.5	12.9	-1.8	100	
R-39	8-20-71	"	4+25	150'RT	534	"	"	"	"								104.9	16.2				121.1	14.3	+1.9	87	
R-39A	8-23-71	"	"	"	"	"	"	"	"								118.1	13.5				118.3	14.4	-0.9	100	Recheck
R-40	"	"	3+20	85'LT	535	"	"	"	"								118.1	12.5				122.0	12.5	±0	97	
R-41	8-24-71	"	1+60	40'LT	537	"	"	"	"								115.5	16.8				115.6	16.2	+0.6	100	
R-42	"	"	4+90	50'RT	538	"	"	"	"								121.9	11.2				119.1	12.5	-1.3	102	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ______ ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E G: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E G 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E G FOR COL 16 + COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 + COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ______
CORPS OF ENGINEERS
PREPARED BY: RHRogers
SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT: Dierks Dam	RIVER Saline STATE Ark TOWN Dierks	CONTRACT NO. DACW 56-C-71-0159	CONTRACTOR Amis Const. Co.	DATE OF REPORT: 10-4-71	REPORT NO: 4 SHEET 2 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ___ 3-4 ___ 5- ___ 6-7 ___ 8-9 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Random	95	± 3%	SFR	12	8	
			VT	12	4	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 3/4" FRACTION DRY DENSITY (PCF) (COL 18)	-#4 3/4" FRACTION WATER CONTENT (%) (COL 19)	TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-43	8-25-71	WV	3+75	57'LT	539	12	RT. Emb Random	N. Ridge Spillway	Tan GM(E)								116.6	15.8				120.4	12.9	+2.9	98	
R-44	"	"	3+00	60'RT	540	"	"	"	"								120.4	12.5				116.9	15.7	-3.2	100	
R-45 6	8-26-71	"	4+85	70'RT	537.5	"	"	"	Tan CL(E)								108.4	17.3				107.4	18.5	-1.2	101	
R-46	"	"	4+00	100'RT	"	"	"	"	Tan GM(E)								116.0	13.5				120.0	13.7	-0.2	97	
R-47	8-27-71	"	3+20	50'RT	538	"	"	"	"								118.6	11.0				122.5	12.6	-1.6	97	
R 48	"	"	3+75	40'LT	535	"	"	"	"								114.2	15.9				116.6	15.8	+0.1	98	
R-49	8-30-71	"	3+00	40'RT	538	"	"	"	"								116.6	15.0				114.9	14.7	+0.3	102	
R-50	"	"	3+10	110'RT	"	"	"	"	"								109.2	14.5				112.4	15.1	-0.6	97	
R-51	8-31-71	"	5+00	110'RT	537	"	"	"	Tan CL(E)								108.9	21.6				106.1	22.8	-1.2	103	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 7 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN-DIAM MOLD, (B) 6-IN-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ___

CORPS OF ENGINEERS

PREPARED BY: RHRoy[illegible]

SUBMITTED BY: ___

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(2) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT. Dierks Dam	RIVER Saline STATE Ark TOWN Dierks	CONTRACT NO DAWC 56-C-71-0159	CONTRACTOR Ami's Const. Co.	DATE OF REPORT. 10-4-71	REPORT NO. 4 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ______ 3-4 ______ 5 ______ 6-7 ______ 8-9 ______ 10-13 ______

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Impervious	95	+3% -1%	SFR	12	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	GRADATION: MAX PART SIZE (IN) (COL 11)	GRADATION: % PASSING #4 SIEVE (COL 12)	GRADATION: % PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	ATTERBERG LIMITS: PI (NOT PL) (COL 15)	IN PLACE TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	IN PLACE TOTAL SAMPLE: WATER CONTENT (%) (COL 17)	IN PLACE - No. 4 FRACTION: DRY DENSITY (PCF) (COL 18)	IN PLACE - No. 4 FRACTION: WATER CONTENT (%) (COL 19)	STANDARD METHOD: TEST (COL 20)	STANDARD METHOD: MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD: OPT WATER CONTENT (%) (COL 22)	RCCM: MAX DRY DENSITY (PCF) (COL 23)	RCCM: OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-12	8-3-71	WV	1+65	6' LT	529	12	RT Emb. Imper.	Area E	Red CL			62.0	52.5				114.2	15.4				115.2	15.0	+0.4	99	
I-13	8-17-71	"	4+25	5' RT	535	"	"	"	Red CL (E)								112.3	17.1				111.7	17.4	-0.3	100	
I-14	8-20-71	"	4+60	℄	"	"	"	"	"								110.0	16.7				115.9	15.2	+1.1	95	
I-15	8-31-71	"	1+66	"	541	"	"	"	"								112.9	15.1				113.3	15.2	-0.1	100	

NOTES: (2) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E G: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1904. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NE UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E G: 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

COL 26 INDICATE DERIVATION, E G: FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ______

CORPS OF ENGINEERS

PREPARED BY: KMcCoy

SUBMITTED BY: ______

RESIDENT ENGINEER

ENG FORM 4080

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(a) MonThly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO:
DierKs Dam	Saline / ArK / DierKs	DACW 56-C-71-0159	Amis Const. Co.	10-5-71	5 SHEET 2 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT. Emb. Random	95	±3%	SFR	12	8	
			VT	12	4	

TEST NO. (COL 1)	DATE MADE (COL 2)	TY. OF TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	GRADATION: MAX PART SIZE (IN.) (COL 11)	GRADATION: % PASSING #4 SIEVE (COL 12)	GRADATION: % PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	ATTERBERG LIMITS: PI (NOT PL) (COL 15)	IN PLACE TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	IN PLACE TOTAL SAMPLE: WATER CONTENT (%) (COL 17)	IN PLACE -3/4 FRACTION: DRY DENSITY (PCF) (COL 18)	IN PLACE -3/4 FRACTION: WATER CONTENT (%) (COL 19)	STANDARD METHOD: TEST (COL 20)	STANDARD METHOD: MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD: OPT WATER CONTENT (%) (COL 22)	RCCM: MAX DRY DENSITY (PCF) (COL 23)	RCCM: OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-68	9-22-71	WV	5+00	100'RT	553	12	RT Emb Random	N. Ridge Spillway	Tan GC (E)																	Too rocky To density
R-69	"	"	4+75	35'LT	548	"			"								128.1	9.7				120.6	12.8	-3.1	106	Very rocky
R-70 G	9-24-71	"	4+00	50'RT	553	"			Tan SC (E)	2	64	43														Too rocky To density
R-71	"	"	4+00	30'LT	548	"											119.2	13.9				119.5	13.3	+0.6	100	
R-72	9-27-71	"	4+25	60'LT	552	"			Tan GC (E)	2	47	27														Too rocky To density

NOTE: (a) FILL IN APPROPRIATE WORD; DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED E.G. SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G. AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22 MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 + COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY FOR COL 18 + COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER ____

CORPS OF ENGINEERS

PREPARED BY: RHRogers

SUBMITTED BY: ____

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

U.S. GOVERNMENT PRINTING OFFICE

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT: Dierks Dam	RIVER: Saline STATE: ArK TOWN: Dierks	CONTRACT NO: ~~Amis Const. Co.~~ DACW 56-C-71-0159	CONTRACTOR: Amis Const. Co.	DATE OF REPORT: 10-5-71	REPORT NO: 5 SHEET 1 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5-, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT Emb Random	95	±3%	SFR	12	8	
			VT	12	4	

TEST IDENTIFICATION

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)
R-52G	9-7-71	WV	3+50	56'LT	539	12	RT Emb Random	N. Ridge Spillway
R-53	"		2+75	50'RT	541			
R-54	9-8-71		1+75	100'LT	538			
R-55	9-9-71		4+50	100'RT	541			
R-56	"		2+75	75'LT	538			
R-57	9-10-71		4+00	100'RT	545 S			
R-58	9-13-71		4+90	60'RT	542			
R-59	"		0+50	40'LT	555			
R-60G	9-14-71		3+70	80'RT	548			
R-61	"		3+00	75'RT	548			
R-62	9-15-71		4+00 2+90 3+00	60'RT 50'LT 40'LT 30'LT	548 547 551 550			
R-63	"		3+05	45'RT	548			
R-64	9-16-71		1+50 3+00 3+50	45'LT 30'LT 20'LT	554 551 550			
R-65	9-17-71		3+00	60'RT	553			
R-66	9-20-71		5+50	75'RT	551			
R-67	"	↓	4+00	40'LT	547	↓	↓	↓

CLASSIFICATION / IN-PLACE DATA / LABORATORY TEST DATA / FIELD AND LABORATORY CORRELATION

TEST NO	CLASS WORD OR LETTER SYMBOL (COL 10)	GRADATION: MAX PART SIZE (IN) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	WATER CONTENT (%) (COL 17)	-#4 (3/4) FRACTION: DRY DENSITY (PCF) (COL 18)	WATER CONTENT (%) (COL 19)	STANDARD METHOD: TEST (COL 20)	MAX DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	RCCM: MAX DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-52G	Tan GC(E)	1	70	43					116.5	12.4				115.4	13.4	-1.0	101	
R-53									110.7	13.4				111.5	16.8	-3.4	99	
R-54									110.6	12.2				112.7	14.4	-2.2	98	
R-55									117.8	15.5				115.9	15.6	-0.1	102	
R-56									114.2	18.1				114.1	15.8	+2.3	100	
R-57									109.6	15.6				114.6	16.4	-0.8	96	
R-58									120.0	12.6				115.6	13.9	-1.3	104	42% + 3/4"
R-59																		Too rocky To density
R-60G	Tan GW-GM	4	17	10					113.0	10.4				120.5	12.7	-2.3	94	10% + 3/4" Test Not Valid
R-61																		Too rocky To Test
R-62																		~~[illegible]~~ Too rocky To Test
R-63									124.2	12.3				123.5	12.1	+0.2	101	
R-64	Tan GM(E)	4	21	13														Too rocky To Test
R-65									109.4	9.7				120.8	12.1	-2.4	91	Unable to re-check, Too rocky
R-66	Tan SC(E)	2	57	39														Too rocky To density
R-67									113.4	11.5				119.8	13.4	-1.9	95	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E G: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E G 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

COL 26 INDICATE DERIVATION, E G FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER ______

CORPS OF ENGINEERS

PREPARED BY: RWRogers

SUBMITTED BY: ______

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(a) MonThly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO:
Dierks Dam	Saline / Ark / Dierks	DACW 56-C-71-0159	Amis Const. Co	10-5-71	5 SHEET 3 OF 3

SPACE RESERVED FOR PUNCH CARD OPERATOR

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT Emb. Impervious	95	+3% -1%	SFR	~~4~~ 8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	MAX. DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	SCCM MAX DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-16L(R)	9-2-71	WY	3+00	℄	539 2	12	Rt. Emb. Imper.	Area E				45.0	31.4				118.7	14.8				116.9	15.0	-0.2	102	
I-17	9-8-71		2+00	5' LT	542												110.6	14.9				115.3	15.4	-0.5	96	
I-18	9-10-71		2+50	℄	546 5												113.6	17.1				112.1	16.6	+0.5	101	
I-19	9-14-71		1+25	℄	555												109.5	15.8				111.6	16.2	-0.4	98	
I-20L	9-16-71		3+50	℄	550							36.7	32.6				108.4	12.4				116.5	14.0	-1.6	93	Ripped up watered rerolled
I-20A	9-17-71		3+00	℄	550												112.2	14.8				116.5	14.7	+0.1	96	Recheck
I-21	9-20-71		17+79E	6' E. of Cond.	449 2		Conduit Backfill										108.0	17.6				112.9	16.4	+1.2	96	
I-22	"		18+59E	18' E. of Conduit	448 2												109.1	18.3				109.9	17.7	+0.6	99	
I-23	"		17+85E	4' W. of Conduit	449												110.1	19.3				113.2	17.7	+1.6	97	
I-24	9-21-71		18+23E	1' W of Conduit	450 5												107.1	19.5				109.9	19.5	±0	98	
I-25L	"		17+80E	5' E. of Conduit	451							57.7	35.0				105.4	21.1				109.6	19.1	+2.0	96	
I-26	9-27-71		5+00	℄	552		RT. Emb										105.7	20.0				109.8	18.1	+1.9	96	
I-27	9-28-71		20+25E 19+80A		444		Conduit Backfill										108.7	18.4				110.1	16.6	+1.8	99	
I-28	9-30-71		5+40	3' RT	557		RT. Emb.										111.6	15.7				112.7	16.8	-1.1	99	
I-29	"		20+30E	5' RT	448		Conduit Backfill										108.2	18.5				113.3	16.2	+2.3	96	
I-30L	"		20+25E	15 RT	449							60.9 ~~59.2~~	34.5 ~~37.5~~				108.6	17.5				112.9	15.5	+2.0	96	

NOTES: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER

CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY:

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF PERVIOUS SOILS AND ROCKFILL FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	River: Saline; State: Ark; Town: Dierks	DACW 56-C-71-0159	Amis. Const. Co.	10-5-71	5 — SHEET 4 OF 4

SPACE RESERVED FOR PUNCH CARD OPERATOR
1 — CARD NO. 1 AND CARD NO. 2
2-3 ___ 7-8 ___ 15 ___
4-5 ___ 8-10 ___ 16 ___
6 ___ 11-14 ___ 17-19 ___

EMBANKMENT ZONE	SPECIFIED (%) COMP	REL DEN	COMPACTION EQUIP (b)	LOOSE LIFT THICKNESS (IN.)	NO OF PASSES	WEIGHT (LB) OR CONT PRESS (PSI)
Random Earth	95		SFR	12	8	27,240
			VT	12	4	21,700

EMBANKMENT ZONE	ROCK DESCRIPTION TYPE	COLOR	HARDNESS	% WEATHERED

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) OR VOLUME (CF) (COL 7)	EMBANKMENT ZONE (COL 8)	SOURCE (COL 9)	CLASS LETTER SYMB (COL 10)	MAX PART SIZE (IN) (COL 11)	6" (COL 12)	3" (COL 13)	2" (COL 14)	1" (COL 15)	3/4 (COL 16)	3/8 (COL 17)	#40 (COL 18)	#200 (COL 19)	__ FRACTION (COL 20)	+4 (COL 21)	-4 FRACTION (COL 22)	#200 (COL 23)	UNIF COEF C_u D_{60}/D_{10} (COL 24)	APPARENT SPECIFIC GRAVITY +#4 (COL 25)	-#4 (COL 26)	DRY DENSITY FIELD (PCF) (COL 27)	LABORATORY TEST METHOD (COL 28)	MAXIMUM (PCF) (COL 29)	MINIMUM (PCF) (COL 30)	% COMP OR REL DEN (COL 31)	COMMENTS ON TESTS (COL 32)
R-52 G	9-7-71	WV	3+50	53' LT	539	12"	Random Earth	N. Ridge Spillway	SC (E)		100	100	100	95	89	80	51	43													
R-60 G	9-14-71	"	3+70	80' RT	548	"	"	"	GW-GM (E)		100	72	47	27	23	20	13	10													
R-64	9-16-71	GS	1+50 3+00 3+50	45' LT 30' LT 30' LT	554 551 550	"	"	"	GM (E)		100	89	76	49	42	23	17	13													
R-66	9-20-71	"	5+50	15' RT	551	"	"	"	SC (E)		100	100	95	77	71	60	51	39													
R-70 G	9-24-71	"	4+00	50' RT	553	"	"	"	"		100	100	97	93	77	68	56	43													
R-72	9-27-71	"	4+25	60' LT	552	"	"	"	GC (E)		100	100	84	66	61	50	42	27													

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY WEEKLY MONTHLY OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED E G : PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR) CRAWLER TRACTOR (CT), RUBBER TIRED TRACTOR (RTT) STEEL TAMPING PLATE (STP), OTHER ________ ( )

COL 3 FOR GRAVEL OR SAND FILL: WATER VOLUME (WV) SAND VOLUME (SV) NUCLEAR METHOD (NM), GRADATION SAMPLE (GS), OTHER ________ ( ) FOR ROCKFILL: GRADATION SAMPLE (GS) DENSITY TEST (DT).

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 GRAVEL OR SAND FILL, SHOW DEPTH BELOW COMPACTED SURFACE TO TOP OF DENSITY TEST (E G "18"), ROCKFILL, SHOW VOLUME OF DENSITY TEST HOLE (E G "215 CF")

COL 9 E G AREA C, SPILLWAY EXCAVATION, ETC

COL 10 WHEN CLASSIFICATION ESTIMATED NOTE BY LETTER (E)

COL 27 IF ESTIMATED SO NOTE AS 110-E AND STATE HOW ESTIMATED IN FOOTNOTE

COL 28 VIBRATORY TABLE (VT) PROVIDENCE VIBRATED DENSITY (PVD) OTHER ________ ( ) REPORT SEPARATELY DETAILS OF SPECIAL LABORATORY PROCEDURES USED

COL 31 INDICATE HOW DERIVED, E G PERCENT COMPACTION (D_c) OR RELATIVE DENSITY (D_d) BY PLACING APPROPRIATE SYMBOL (D_c OR D_d) OVER VALUE OBTAINED

COL 32 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA REWORKED AND RETESTED DENOTE BY LETTER (R)

U. S. ARMY ENGINEER
____
CORPS OF ENGINEERS

PREPARED BY:
RWRogers

SUBMITTED BY:
____
RESIDENT ENGINEER

ENG FORM 4081
JUN 67

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

(MAIN FORM)

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO.
Dierks Dam	River: Saline; State: Ark.; Town: Dierks	DACW 56-C-71-0159	Amis Const. Co.	11-3-71	6 ; SHEET 1 OF #4

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT Emb. Random	95	±3%	SFR	12	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING 3/4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-73	10-1-71	WV	5+80	120'RT	557	12	RT Emb Random	Spillway									111.8	15.3				117.3	15.3	0	95	
R-74	10-5-71		3+50	40'RT	558												117.3	14.8				117.6	14.7	+0.1	100	
R-75	10-6-71		4+50	35'LT	560					8	~~48~~ 63	24														Too rocky To density
R-76	10-12-71		4+50	40'RT	560												115.8	13.2				118.6	13.3	-0.1	98	
R-77	10-13-71		4+00	30'LT	566					8	~~25~~ 43	16														Too rocky To density
R-78	10-25-71		2+50	25'LT	573					8	~~28~~ 43	10														"

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER
COL 5 RECORD OFFSET BY DISTANCE UPS (REAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER AS THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	Saline / Ark. / Dierks	DACW 56-6-71-0159	Amis Const. Co.	11-3-71	6 — SHEET 2 OF 4

SPACE RESERVED FOR PUNCH CARD OPERATOR

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT Emb & Main Emb. Impervious	95	+3%-1%	SER	8	8	

TEST NO (Col 1)	DATE MADE (Col 3)	TYPE TEST (Col 3)	STATION (Col 4)	OFFSET (FT) (Col 5)	ELEVATION (FT) (Col 6)	DEPTH (IN.) (Col 7)	EMBANKMENT ZONE (Col 8)	BORROW SOURCE (Col 9)	CLASS WORD OR LETTER SYMBOL (Col 10)	MAX PART SIZE (IN.) (Col 11)	% PASSING #4 SIEVE (Col 12)	% PASSING #200 SIEVE (Col 13)	LL (Col 14)	PI (NOT PL) (Col 15)	TOTAL SAMPLE DRY DENSITY (PCF) (Col 16)	TOTAL SAMPLE WATER CONTENT (%) (Col 17)	-3/4" FRACTION DRY DENSITY (PCF) (Col 18)	-3/4" FRACTION WATER CONTENT (%) (Col 19)	STANDARD METHOD TEST (Col 20)	STANDARD MAX DRY DENSITY (PCF) (Col 21)	STANDARD OPT WATER CONTENT (%) (Col 22)	RCCM MAX DRY DENSITY (PCF) (Col 23)	RCCM OPT WATER CONTENT (%) (Col 24)	W % + OR - (Col 25)	PERCENT COMPACTION (Col 26)	COMMENTS ON TESTS (Col 27)
I-31	10-1-71	WV	20+00 E 19+50 E		444	12	Conduit Backfill	Area E	Red CL(E)								105.7	17.2				111.8	16.4	+0.6	95	
I-32	10-4-71		19+15 E 20+15 A		454		"		"								107.6	17.7				113.7	15.9	+1.8	95	
I-33	"		20+00 E 20+35 A		450 E		"		"								108.4	16.8				113.6	15.5	+1.3	95	
I-34	11-5-71		5+00	℄	558		RT. Emb.		"								114.1	14.1				113.8	15.2	-1.1	100	
I-35L	"		20+00 E 19+60 A		449		Conduit Backfill		"			57.2	37.5	~~[illegible]~~			102.4	21.4				110.6	17.3	+4.1	93	Ripped up & Rerolled
I-35A	10-6-71		19+60 A 20+00 E		"		"		"								102.3	21.2				109.2	18.4	+2.8	94	Recheck Unsatisfactory
I-35B	10-7-71		"		"		"		"								101.0	21.5				110.2	17.2	+4.3	92	"
I-35C	"		"		"		"		"								110.2	18.2				111.8	16.5	+1.7	99	2' fill removed Allowed to dry RECHECK
I-36	10-6-71		20+08 A 19+18 E		454		"		"								111.3	15.3				117.6	15.2	+0.1	95	
I-37	10-7-71		20+15 A 18+80 E		453 E		"		"								108.4	15.5				114.6	15.5	0	95	
I-38	"		19+85 A 18+05 E		454		"		"								112.4	17.4				114.5	16.0	+1.4	98	
I-39	10-8-71		19+90 A 18+10 E		457		"		"								105.6	18.4				108.4	18.7	-0.3	97	
I-40L	"		20+18 A 18+00 E		457		"		"			57.1	41.0				111.7	16.3				110.9	17.1	-0.8	101	
I-41	10-11-71		19+85 A 18+50 E		460		"		"								105.4	17.7				109.9	18.1	-0.4	96	
I-42	"		20+60 A	20' RT	454		"		"								110.7	16.1				112.4	16.7	-0.6	99	
I-43	10-14-71		3+00	4' LT	570		RT. Emb.		"								111.9	13.0				115.0	15.0	-2.0	97	Ripped up, watered, rerolled

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY OR PERIODIC

(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER______( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER ______

CORPS OF ENGINEERS

PREPARED BY: RWRogers

SUBMITTED BY: ______

RESIDENT ENGINEER

ENG FORM 4080 JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1967 [illegible]

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT.	REPORT NO.
Diorks Dam	RIVER Saline; STATE. Ark; TOWN. Diorks	DACW 56-C-71-0159	Amis Const. Co.	11-3-71	6; SHEET 3 OF 4

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ——— 6-7 ———
3-4 ——— 8-9 ———
5 ——— 10-13 ———

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RT Emb + Main Emb Impervious	95	+3 -1	SFR	8	8	

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART. SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	-3/4 FRACTION DRY DENSITY (PCF)	-3/4 FRACTION WATER CONTENT (%)	STANDARD METHOD TEST	STANDARD METHOD MAX DRY DENSITY (PCF)	STANDARD METHOD OPT WATER CONTENT (%)	RCCM MAX DRY DENSITY (PCF)	RCCM OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-44	10-14-71	WV	Main Em M+10	5'RT	439	12	Main Emb.	Area E	Red CL(E)								110.7	17.4				112.4	15.4	+2.0	99	
I-45L	"	"	19+05	℄	441	"	"	"	"			52.0	36				110.7	16.3				110.9	16.9	-0.6	100	
I-46	10-22-71	"	19+10	℄	443	"	"	"	"								109.3	18.3				108.2	18.9	-0.6	101	
I-47	10-25-71	"	19+50	℄	455	"	"	"	"								111.6	17.3				113.5	15.9	+1.4	98	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ______ ( )
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E G: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21 22 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E G 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E G FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ______
CORPS OF ENGINEERS
PREPARED BY: RHogan
SUBMITTED BY:
RESIDENT ENGINEER

RCS: ENGCW-E-11(R1)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF PERVIOUS SOILS AND ROCKFILL FOR CIVIL WORKS PROJECTS

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO
Dierks Dam	RIVER Saline STATE Ark TOWN Dierks	DACW 56-C-71-0159	Amis Const. Co.	11-3-71	6 SHEET 4 OF 4

SPACE RESERVED FOR PUNCH CARD OPERATOR
1— CARD NO. 1 AND CARD NO 2
2-3 ___ 7-8 ___ 15— ___
4-5 ___ 9-10 ___ 16— ___
6— ___ 11-14 ___ 17-19 ___

EMBANKMENT ZONE	SPECIFIED (%) COMP	REL DEN	COMPACTION EQUIP (b)	LOOSE LIFT THICKNESS (IN)	NO OF PASSES	WEIGHT (LB) OR CONT PRESS (PSI)
Random Earth	95		SFR	11/2	8	27,200

ROCK DESCRIPTION EMBANKMENT ZONE	TYPE	COLOR	HARDNESS	% WEATHERED

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) OR VOLUME (CF) (COL 7)	EMBANKMENT ZONE (COL 8)	SOURCE (COL 9)	CLASS LETTER SYMB (COL 10)	MAX PART SIZE (IN) (COL 11)	6" (COL 12)	3" (COL 13)	2" (COL 14)	1" (COL 15)	3/4" (COL 16)	3/8" (COL 17)	40 (COL 18)	200 (COL 19)	___ FRACTION (COL 20)	#4 (COL 21)	-4 FRACTION (COL 22)	#200 (COL 23)	UNIF COEF C_u D_{60}/D_{10} (COL 24)	APPARENT SPECIFIC GRAVITY +04 (COL 25)	-04 (COL 26)	DRY DENSITY FIELD (PCF) (COL 27)	TEST METHOD (COL 28)	LABORATORY MAXIMUM (PCF) (COL 29)	MINIMUM (PCF) (COL 30)	% COMP OR REL DEN (COL 31)	COMMENTS ON TESTS (COL 32)
R-75	10-6-71	GS	4+50	35' LT	560	12	RT Emb Random	Spillway			100	100	94	72	63	44	34	24													
R-77	10-13-71	"	4+00	30' LT	566	"	"	"			100	91	73	49	43	28	22	16													
R-78	10-28-71	"	2+50	25' LT	573						100	87	76	53	45	35	19	10													

NOTE (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED E G : PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) CRAWLER TRACTOR (CT) RUBBER-TIRED TRACTOR (RTT) STEEL TAMPING PLATE (STP) OTHER ___ ( )

COL 3 FOR GRAVEL OR SAND FILL: WATER VOLUME (WV) SAND VOLUME (SV) NUCLEAR METHOD (NM) ___ ( ) FOR ROCKFILL: GRADATION SAMPLE (GS), OTHER ___ SAMPLE (GS) DENSITY TEST (CT)

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 GRAVEL OR SAND FILL, SHOW DEPTH BELOW COMPACTED SURFACE TO TOP OF DENSITY TEST (E G "48"), ROCKFILL, SHOW VOLUME OF DENSITY TEST HOLE (E G "215 CF")

COL 9 E G AREA C SPILLWAY EXCAVATION ETC

COL 10 WHEN CLASSIFICATION ESTIMATED NOTE BY LETTER (E)

COL 27 IF ESTIMATED SO NOTE AS 110-E AND STATE HOW ESTIMATED IN FOOTNOTE

COL 28 VIBRATORY TABLE (VT) PROVIDENCE VIBRATED DENSITY (PVD) OTHER ___ ( ) REPORT SEPARATELY DETAILS OF SPECIAL LABORATORY PROCEDURES USED

COL 31 INDICATE HOW DERIVED, E G PERCENT COMPACTION (Dc) OR RELATIVE DENSITY (Dd) BY PLACING APPROPRIATE SYMBOL (Dc OR Dd) OVER VALUE OBTAINED

COL 32 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA REWORKED AND RETESTED DENOTE BY LETTER (R)

U. S. ARMY ENGINEER ___
CORPS OF ENGINEERS

PREPARED BY: RWiggins

SUBMITTED BY: ___
RESIDENT ENGINEER

ENG FORM 4081
JUN 67

U.S. GOVERNMENT PRINTING OFFICE: 1967 306-021 (82)

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO.:
Dierks Dam	RIVER Saline STATE Ark. TOWN Dierks	DACW 56-C-71-0159	Amis Const. Co.	12-10-71	7

SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ______ 3-4 ______ 5- ______ 6-7 ______ 8-9 ______ 10-13 ______

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	±3	SFR	12	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING No 4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-79	11-2-71	WY	2+50	40 RT	574	12	Random RT. Emb.	Spillway																		
R-80G	11-3-71		19+50	30' RT	453		Random Main Emb			8	78	19					121.0	10.1				123.2	11.3	-1.7	98	
R-81	11-4-71		19+90	30' RT	454		"										117.9	12.5				126.7	11.0	+1.5	95	
R-82	11-5-71		20+15	30' RT	457		"										117.1	12.3				122.9	12.3	0	95	
R-83	11-17-71		21+75	56' LT	460		"										116.5	9.4				122.0	11.4	-2.0	95	
R-84	11-26-71		5+00	20' LT	578		Random RT. Emb.			8	30	9					120.8	12.4				122.4	12.5	-0.1	98	Too rocky to density

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

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COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1 POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION. E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: K. McGuire [signature]

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT:	REPORT NO.:
Dierks Dam	RIVER Saline; STATE Ark.; TOWN Dierks	DACW 56-C-71-0159	Amis Const. Co.	12-10-71	7 — SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 6-7 ____

3-4 ____ 8-9 ____

5- ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	15	+3 -1	SFR	8	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	GRADATION: MAX PART SIZE (IN) (COL 11)	GRADATION: % PASSING #4 SIEVE (COL 12)	GRADATION: % PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	ATTERBERG LIMITS: PI (NOT PL) (COL 15)	IN PLACE, TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	IN PLACE, TOTAL SAMPLE: WATER CONTENT (%) (COL 17)	IN PLACE, - #4 FRACTION: DRY DENSITY (PCF) (COL 18)	IN PLACE, - #4 FRACTION: WATER CONTENT (%) (COL 19)	LAB, STANDARD METHOD: TEST (COL 20)	LAB, STANDARD METHOD: MAX DRY DENSITY (PCF) (COL 21)	LAB, STANDARD METHOD: OPT WATER CONTENT (%) (COL 22)	LAB, RCCM: MAX DRY DENSITY (PCF) (COL 23)	LAB, RCCM: OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-48	11-4-71	WV	19+40	℄	455	12	Main Emb. Impervious	Area "E"	Red CL (6)								110.2	16.8				112.2	16.5	+0.3	98	
I-49	11-5-71		20+40	10' RT	458												116.7	11.3				118.1	13.1	-1.8	99	Ripped up watered, rerolled
I-50	11-15-71		21+75	℄	457												104.2	17.8				110.0	17.8	0	95	
I-51L	11-16-71		22+00	15' LT	456							47	30				110.4	16.7				114.1	15.4	+1.3	98	
I-52	11-17-71		21+40	5' LT	459												102.9	19.8				111.7	18.4	+1.4	92	Rejected
I-52A	"		"	"	"												114.7	16.0				113.0	15.6	+0.4	101	Recheck
I-53	11-22-71		22+10	25' LT	458												110.0	16.9				109.5	17.6	-0.7	101	
I-54	11-23-71		19+90A 17+04E		453												107.8	18.6				112.6	16.7	+1.9	96	
I-55L	11-27-71		4+50	℄	583		RT. Emb. Impervious					21	28				118.7	12.3				120.3	12.6	-0.3	98	
I-56	"		20+15A 17+03E		456		Main Emb. Impervious										111.8	16.1				115.8	15.5	+0.6	97	
I-57	11-29-71		20+00A 17+20E		464		"										108.1	17.5				115.6	16.0	+1.5	95	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E G : SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV), WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E G : AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS (N) UNDER COL 27 AND REPORT DETAILS OF PROCEDURE

COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E G FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER ____

CORPS OF ENGINEERS

PREPARED BY: CMcGee

SUBMITTED BY: ____

RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT.		CONTRACT NO.	CONTRACTOR	DATE OF REPORT.	REPORT NO.:
Dierks Dam	RIVER Saline STATE Ark TOWN Dierks	DACW56-C-71-0159	Anis Const. Co.	1-17-72	8. SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ______ 6-7 ______
3-4 ______ 8-9 ______
5 ______ 10-12 ______

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED w % LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SFR	12	8	
Impervious Core	95	+3 -1	"	8	8	

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	-#4 FRACTION DRY DENSITY (PCF)	-#4 FRACTION WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	w % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
14-19	20	21-26	27-31	32-35	33-36	38	40	41	42	43-44	47-50	51-53	54-56	57-60	61-63	64-67	68-70	71	72-75	76-78	72-75	76-78				
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27

Column groups: TEST IDENTIFICATION (COL 1–9); CLASSIFICATION – GRADATION, ATTERBERG LIMITS (COL 10–15); IN-PLACE DATA – TOTAL SAMPLE, -#4 FRACTION (COL 16–19); LABORATORY TEST DATA – STANDARD METHOD (COL 20–22), (COL 23–24); FIELD AND LABORATORY CORRELATION (COL 25–26).

No Random or Impervious mat'l placed during Dec 1971

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV), WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ______ ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S
COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.
COL 26 INDICATE DERIVATION E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED DENOTE BY (R)

U S ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: K H Logan

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT.	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT.	REPORT NO.
Dierks Dam	RIVER Saline; STATE Ark.; TOWN Dierks	DACW 56-C-71-0159	Amis Const. Co.	2-3-72	9 — SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	± 3	SFR	12	8	

TEST IDENTIFICATION: TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN.)	EMBANKMENT ZONE	BORROW SOURCE	CLASSIFICATION: CLASS WORD OR LETTER SYMBOL	GRADATION: MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	ATTERBERG LIMITS: LL	PI (NOT PL)	IN-PLACE DATA: TOTAL SAMPLE: DRY DENSITY (PCF)	WATER CONTENT (%)	—3/4 FRACTION: DRY DENSITY (PCF)	WATER CONTENT (%)	LABORATORY TEST DATA: STANDARD METHOD: TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	RCCM: MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	FIELD AND LABORATORY CORRELATION: W % + OR −	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-85	1-25-72	WV	19+35	45 LT	464	12	Main Emb	Spillway	CL								112.9	17.3				114.2	16.7	+0.6	99	
R-86	1-31-72	"	20+75	45 RT	460	"	"	"	"								111.8	10.6				123.3	12.5	-1.9	91	See Report "11 for recheck

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G.: AREA C SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK. E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION. E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U.S. ARMY ENGINEER ____
CORPS OF ENGINEERS
PREPARED BY: RARoyer
SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(8) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT. Dierks Dam	RIVER Saline STATE Ark. TOWN Dierks	CONTRACT NO DACW 56-C-71-0159	CONTRACTOR Amis Const. Co.	DATE OF REPORT. 2-3-72	REPORT NO: 9	SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ———— 3-4 ———— 5 ———— 6-7 ———— 8-9 ———— 10-13 ————

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (B)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3, -1	SFR	8	8	

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	-#4 3/4 FRACTION DRY DENSITY (PCF)	-#4 3/4 FRACTION WATER CONTENT (%)	TEST	MAX DRY DENSITY (PCF)	OPT WATER CONTENT (%)	RCCM MAX DRY DENSITY (PCF)	RCCM OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-58	12-1-71	WV	1+00	℄	587	12	RT Emb	Area "E"	Red CL								116.8	12.1				119.9	12.5	-0.4	97	
I-59	1-24-72		19+25	335' LT	461	"	2nd Stage Cofferdam	"	"								110.1	16.2				113.9	16.0	+0.2	97	
I-60L	1-25-72		"	℄	462	"	Main Emb	"	"								109.5	15.6	B	114.5	15.0	114.5	15.7	-0.1	96	
I-61	1-31-72		20+65	10' RT	463	"	"	"	"								114.9	16.6				113.4	16.1	+0.5	101	

NOTES: (8) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY OR PERIODIC
(B) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23 24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY; FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER

CORPS OF ENGINEERS

PREPARED BY:

SUBMITTED BY:

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT.	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO:
Dierks Dam	RIVER Saline STATE: Ark. TOWN Dierks	DACW-56-C-71-0159	Amis Const. Co.	3-3-72	10 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ___ 3-4 ___ 5- ___ 6- ___ 7-9 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	± 3	SFR	12	8	

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN)	% PASSING 3/4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	-3/4" FRACTION DRY DENSITY (PCF)	-3/4" FRACTION WATER CONTENT (%)	STANDARD METHOD TEST	STANDARD METHOD MAX DRY DENSITY (PCF)	STANDARD METHOD OPT WATER CONTENT (%)	RCCM MAX DRY DENSITY (PCF)	RCCM OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-86R	2-2-72	WV	20+75	45' RT	460	12	Main Emb	Spillway									120.6	15.1				117.5	15.2	-0.1	103	Recheck
R-87	"	"	21+00	41' LT	471	"	"	"									121.5	12.1				119.5	13.8	-1.7	102	
R-88	2-16-72	"	22+50	35' RT		"	"	"		8	65	21														Too rocky to density

NOTE: (1) FILL IN APPROPRIATE WORD, DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ______ ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
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U.S. ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: R.M. Ryan

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO:
Dierks Dam	River: Saline State: Ark. Town: Dierks	DACW-56-C-71-0159	Amis Const Co.	3-3-72	10

SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	+3 To -1	SFR	8	8	

TEST IDENTIFICATION / CLASSIFICATION / IN PLACE DATA / LABORATORY TEST DATA / FIELD AND LABORATORY CORRELATION

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	GRADATION: MAX PART SIZE (IN) (COL 11)	GRADATION: % PASSING #4 SIEVE (COL 12)	GRADATION: % PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	ATTERBERG LIMITS: PI (NOT PL) (COL 15)	TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE: WATER CONTENT (%) (COL 17)	-#4 FRACTION 3/4: DRY DENSITY (PCF) (COL 18)	-#4 FRACTION 3/4: WATER CONTENT (%) (COL 19)	STANDARD METHOD: TEST (COL 20)	STANDARD METHOD: MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD: OPT WATER CONTENT (%) (COL 22)	RCCM: MAX DRY DENSITY (PCF) (COL 23)	RCCM: OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-62	2-7-72	WU	21+10	15'LT	468	12	Main Emb	Area E	CL								118.3	14.8				114.6	13.8	+1.0	104	
I-63	2-9-72	"	19+25	℄	465	"	"	"	"								113.1	17.6				108.4	18.4	-0.8	104	
I-64	2-11-72	"	22+80	"	471	"	"	"	"								114.9	14.6				117.3	14.6	±0	98	
I-65	2-22-72	"	21+00	20'LT	469	"	"	"	"								113.5	14.1				116.7	14.8	-0.7	97	
I-66	2-29-72	"	21+00	℄		"	"	"	"								114.8	16.4				116.7	16.6	-0.2	98	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1 POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 + COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 + COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER

CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT.	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO
Dierks Dam	RIVER Saline; STATE. Ark; TOWN Dierks	DACW-56-C-71-1159	Amis Const. Co.	4-17-72	11 — SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ___ 3-4 ___ 5 ___ 6-7 ___ 8-9 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	15	+3 To -1	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	MAX DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-67	3-14-72	UV	20+20	U/S Cofferdam	473.6	12	Main Emb	Area E	CL								113.4	11.9				113.7	11.6	+0.3	100	
I-68	3-23-72	"	20+00	℄	474.5	"	"	"	.								109.6	18.5				110.9	19.2	-0.7	99	
I-69	3-28-72	"	18+00	U/S Cofferdam	475	"	"	"	"								108.4	20.3				109.7	20.4	-0.1	99	
I-70	3-31-72	"	16+50	"	475	"	"	"	"								116.2	16.1				114.2	15.3	+0.8	102	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV), NUCLEAR METHOD (NM) OTHER ______ ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E G: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

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COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

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COL 26 INDICATE DERIVATION, E G FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER ______

CORPS OF ENGINEERS

PREPARED BY. [signature]

SUBMITTED BY: ______

RESIDENT ENGINEER

ENG FORM 4080 JUN 67

U.S. GOVERNMENT PRINTING OFFICE

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO.	SHEET ___ OF ___
Derks Dam	RIVER Saline STATE Ark. TOWN Dierks	DACW-56-C-2159	Amis Const. Co.	4-18-72	11	SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED ± % LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth		±3	SPR			

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING 3/4 NO 4 SIEVE	% PASSING NO 200 SIEVE	LL	PI (NOT PL)	TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	-3/4 FRACTION DRY DENSITY (PCF)	-3/4 FRACTION WATER CONTENT (%)	TEST	STANDARD METHOD MAX DRY DENSITY (PCF)	STANDARD METHOD OPT WATER CONTENT (%)	RCCM MAX DRY DENSITY (PCF)	RCCM OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-87	3-1-72	VV	21+00	30' LT	474	12	Random Earth	Spillway				–					123.5	10.0				129.1	10.3	-0.3	96	
	3-2-72	"	22+00	D/S	472	"	"	"		6	46	40														Gradation only
R-90	3-23-72	"	19+50	30' LT	475	"	"	"									124.2	12.5				119.2	13.3	-0.8	104	

NOTE: (1) FILL IN APPROPRIATE WORD DAILY, WEEKLY MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER________( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E G: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

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COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E G FOR COL 16 + COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY FOR COL 18 + COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER ____________

CORPS OF ENGINEERS

PREPARED BY. [signature]

SUBMITTED BY: ____________

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT.	RIVER: Saline / STATE: Ark. / TOWN: Dierks	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO: 12
Dierks Dam		DACW-56-6-71-171	Amis Const Co.	6-6-72	SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5- ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	–	+2 T -1	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-71-L(R)	4-11-72	WV	20+50	℄	480	12	Main Fab	Area E	CL								112.8	17.4				112.0	17.2	-0.2	101	-#200 = 56.0 LL = 39.8 Record sample
I-72	5-3-72	"	21+50	"	486	"	"	"	"								104.8	11.8				117.5	13.0	-1.2	89	Reworked
I-72A	5-4-72	"	"	"	"	"	"	"	"								111.2	16.7				112.6	14.0	+2.7	98	Recheck
I-73	5-11-72	"	23+25	10' RT	492	"	"	"	"								106.7	16.5				112.4	18.6	-2.1	95	Watered Reworked
I-74	5-11-72	"	23+80	11' RT	495	"	"	"	"								118.3	16.1				118.3	14.1	+2.0	100	
I-75L	5-16-72	"	21+50	15' LT	494	"	"	"	"								105.8	17.2				107.4	19.0	-1.8	99	Watered Reworked
I-75L-A	5-17-72	"	-1+50	"	"	"	"	"	"								114.5	11.5				117.8	13.5	-2.0	98	Recheck
I-75L-B	5-19-72	"	"	"	"		"	"	"								117.2	13.6				117.0	13.7	-0.1	100	Recheck
I-76	5-22-72	"	22+50	11' LT	498	"	"	"	"								111.6	18.1				114.2	17.1	+1.0	98	
I-77	5-26-72	"	22+00	℄	476	"	"	"	"								115.5	11.7				115.3	13.8	-2.1	100	Watered Reworked
I-77A	5-29-72	"		"	"		"	"	"								112.6	16.2				111.8	15.0	+1.2	98	Recheck
I-78	5-31-72	"	23+60	℄	506	"	"	"	"								115.6	12.8				114.5	12.7	+1.1	100	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY OR PERIODIC
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COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E G: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
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COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
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U S ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT:	REPORT NO.
Dierks Dam	RIVER Saline STATE Ark. TOWN Dierks	DACW-58-C-71-0159	Amis Const. Co.	6-6-72	12 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ______ 6-7 ______
3-4 ______ 8-9 ______
5- ______ 10-13 ______

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SFR	12	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN) (COL 11)	% PASSING 3/4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-91 (RS)	4-11-72	WV	21+00	30'RT	480	12	Main Emb	Spillway ~~Area~~									118.8	11.3				121.2	12.4	-1.1	98	Recored Sample
R-92 (RS)	"	"	20+50	45'LT	480	"	"	"									117.0	13.4				120.9	13.7	-0.3	97	" "
R-93	5-3-72	"	21+00	60'RT	486	"	"	"									111.5	17.1				114.9	16.6	+0.5	97	
R-94	5-10-72	"	21+00	60'LT	490	"	"	Random Stockpile									120.0	13.8				119.7	14.0	-0.2	100	
R-95	5-11-72	"	17+90	50'LT		"	"	"									119.6	11.0				124.3	11.6	-0.6	96	
R-96	5-11-72	"	17+20	70'LT		"	"	"		6"	58	15														Too rocky To Test
R-97	5-16-72	"	21+55	50'RT	494	"	"	"									119.9	13.0				120.9	13.2	-0.2	99	
R-98	5-19-72	"	18+30	70'LT	487	"	"	"									119.7	11.2				120.8	12.8	-1.6	99	
R-99	"	"	17+40	75'LT	464	"	"	"									117.3	10.7				123.9	11.8	-1.1	95	
R-100 G	5-22-72	"	22+50	50'LT	498	"	"	"		6"	64	24														Too rocky To density
R-101	5-23-72	"	18+75	70'LT	475	"	"	"									109.8	12.5				122.9	12.4	+0.1	89	Recompacted
R-101 A	5-24-72	"	"	"	"	"	"	"									123.6	13.9				121.2	11.4	+2.5	102	Recheck
R-102	5-23-72	"	11+25	55'LT	470	"	"	"									121.6	11.9				124.3	11.8	+0.1	98	
R-103	5-25-72	"	23+75	40'RT	500	"	"	"									119.3	11.7				125.1	9.0	+2.7	95	
R-104	5-31-72	"	23+25	60'LT	503	"	"	"									126.1	10.3				123.4	10.9	-0.6	102	

NOTES: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
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COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ______
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
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COL 26 INDICATE DERIVATION, E.G., FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER ______
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) MONTHLY SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	RIVER Saline STATE Ark. TOWN Dierks	DACW-56-71-C-0159	Amis Const. Co.	7-7-72	13 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	-3 to +1	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 FRACTION WATER CONTENT (%) (COL 19)	TEST (COL 20)	STANDARD METHOD MAX. DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-79	6-8-72	WV	23+50	12'LT	511	12	Main Emb	Area E	CL								114.4	14.1				119.1	11.9	+2.2	96	
I-80L(C)	6-12-72	"	23+00	10'LT	507	"	"	"	"	1½	96.0	41.7	28.7				113.0	17.3	B	117.6	14.7	116.8	14.7	+2.6	97	
I-81	6-15-72	"	24+25	℄	516	"	"	"	"			41.0					111.7	16.6				115.8	16.0	+0.6	99	
I-82	6-20-72	"	24+00	℄	522	"	"	"	"								122.9	13.2				120.4	13.4	-0.2	102	
I-83	6-29-72	"	23+50	℄	520	"	"	"	"								108.5	14.0				114.6	16.5	-2.4	95	Watered rerolled
I-83 A	6-30-72	"	23+00	℄	517	"	"	"	"								113.8	17.6				118.9	14.3	+3.3	96	Recheck Accepted

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G., SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (C) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ______

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23 24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER ______

CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY: ______

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(2) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT: Dierks Dam	RIVER: Saline; STATE: Ark.; TOWN: Dierks	CONTRACT NO: DACW-56-C-71-0159	CONTRACTOR: Hass Const. Co.	DATE OF REPORT: 7-10-72	REPORT NO: 13; SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2, 3-4, 5-, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	± 3	SFR	12	8	

TEST IDENTIFICATION

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)
R-105	6-1-72	W/V	21+50	70'LT	476	12	Main Emb	Random Stockpile
R-106	"	"	17+50	65'LT	478	"	"	"
R-107	6-5-72	"	22+50	30'RT	506	"	"	"
R-108	"	"	19+00	15'LT	486	"	"	"
R-109	6-7-72	"	22+50	65'LT	506	"	"	"
R-110	6-9-72	"	23+50	75'LT	510	"	"	"
R-111	"	"	16+50	70'LT	476	"	"	"
R-112	6-16-72	"	23+25	75'LT	515	"	"	"
R-113	"	"	17+60	80'LT	500	"	"	"
R-114	6-21-72	"	22+50	65'LT	512	"	"	"
R-115	"	"	19+00	60'LT	476	"	"	"
R-116	6-28-72	"	23+00	40'LT	518	"	"	"

CLASSIFICATION / ATTERBERG LIMITS / IN-PLACE DATA

TEST NO	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)
R-105									119.6	12.5
R-106									121.5	13.8
R-107										
R-108									125.0	11.4
R-109									115.4	14.4
R-110		4	62.3	27.0					122.6	11.6
R-111									125.8	10.8
R-112									120.8	12.5
R-113									124.3	11.2
R-114									121.5	14.0
R-115									117.6	12.7
R-116									118.7	12.6

LABORATORY TEST DATA / FIELD AND LABORATORY CORRELATION

TEST NO	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-105				120.9	13.1	-0.6	99	
R-106				122.0	11.8	+2.0	100	
R-107								Unable To complete Test because [illegible]
R-108				122.0	11.5	-0.1	102	
R-109				120.8	12.5	+1.9	96	
R-110				125.9	10.3	+1.3	97	
R-111				124.5	11.1	-0.3	101	
R-112				119.7	13.4	-0.9	101	
R-113				124.3	12.0	-0.8	100	
R-114				117.4	15.8	-1.8	104	
R-115				121.4	13.1	-0.4	99	
R-116				122.9	10.9	+1.7	97	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G. SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 — CYLINDER (CY), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ___

COL 5 — RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 — DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 — E.G. AREA C, SPILLWAY EXCAVATION, ETC

COL 10 — ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 — WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 — STANDARD METHOD, (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NB UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 — 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 — FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 — COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 — INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.

COL 27 — IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER ___ CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY: ___ RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO.
Dierks Dam	RIVER. Saline STATE. Ark. TOWN Dierks	DACW-56-C-71-0159	Amis Const. Co.	8-9-72	14 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5- ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	-3 +1	SFR	8	8	

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	-#4 FRACTION 3/4 DRY DENSITY (PCF)	-#4 FRACTION 3/4 WATER CONTENT (%)	STANDARD METHOD TEST	STANDARD METHOD MAX DRY DENSITY (PCF)	STANDARD METHOD OPT WATER CONTENT (%)	RCCM MAX DRY DENSITY (PCF)	RCCM OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-84	7-6-72	WV	23+50	5' RT	522	12	Main Emb	Area E									106.4	22.6				109.1	21.2	+1.4	98	
I-85L	7-11-72	"	22+00	10' CT	520	"	"	"				35.8	26.3				120.5	13.5				123.5	11.7	+1.8	99	
I-86	7-13-72	"	21+50	9'	521	"	"	"									115.9	17.6				114.6	15.9	+1.7	101	
I-87	7-17-72	"	22+00	4'	523	"	"	"									114.7	17.3				111.3	17.5	-0.2	103	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G. SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 9 E.G., AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS (C) UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK. E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER ____
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY:
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS.

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	River: Saline; State: Ark.; Town: Dierks	DACW-56-C-71-0159	Amis Const. Co.	8-9-72	14; SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ——— 3-4 ——— 5 ——— 6-7 ——— 8-9 ——— 10-13 ———

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SFR	12	8	

Column groups: TEST IDENTIFICATION (COL 1–9); CLASSIFICATION (COL 10–15: GRADATION COL 11–13, ATTERBERG LIMITS COL 14–15); IN-PLACE DATA (TOTAL SAMPLE COL 16–17; -3/4 FRACTION COL 18–19); LABORATORY TEST DATA (STANDARD METHOD COL 20–22; RCCM COL 23–24); FIELD AND LABORATORY CORRELATION (COL 25–26).

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	DRY DENSITY (PCF) (COL 16)	WATER CONTENT (%) (COL 17)	DRY DENSITY (PCF) (COL 18)	WATER CONTENT (%) (COL 19)	TEST (COL 20)	MAX. DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	MAX DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-117	7-6-72	WV	23+50	45'LT	525	12	Main Emb	Random Stockpile									115.4	18.5				116.5	18.9	-0.4	99	
R-118	7-11-72	"	24+00	65'LT	525	"	"	"									127.5	10.4				125.5	10.4	0	102	
R-119	7-13-72	"	21+50	55'LT	521	"	"	"									125.5	11.4				126.8	11.7	-0.3	99	
R-120	7-17-72	"	22+00	40'RT	523	"	"	"									127.2	13.2				119.4	13.4	-0.2	107	
R-121	"	"	21+75	52'LT	522	"	"	Spillway																		Too rocky to density
R-122	7-18-72	"	24+50	50'RT	530	"	"	"									120.3	11.8				116.7	13.7	-1.9	103	
R-123	7-20-72	"	24+00	70'LT	530	"	"	"									113.2	14.4				115.4	15.1	-0.7	98	
R-124	7-20-72	"	23+50	60'RT	529	"	"	"									119.4	14.9				119.0	13.7	+1.2	100	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ______ ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: [illegible signature]

SUBMITTED BY ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	RIVER: Saline STATE: Ark. TOWN: Dierks	DACW-56-C-71-0151	Amis Const. Co	9-5-72	15 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 6 7 ____
3-4 ____ 8-9 ____
5 ____ 10 13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	+3 -13	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W ± % OPT (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-88	8-11-72	1(4)	14+25	36'LT	444	12	#2 Cofferdam	Area "E"	CL								113.0	14.2				115.9	13.7	+0.5	98	
I-89	8-16-72	"	15+15	30'LT	442	"	Main Emb	"	"								118.4	13.9				117.2	14.4	-0.5	101	
I-90L(C)	8-21-72	"	13+00	U/S blanket	423	"	#2 Cofferdam	"	"			60.0	34.5				103.4	12.7	B ~~[illegible]~~	117.3 ~~[illegible]~~	14.1	115.0	14.1	-1.4	90	Plowed up, watered, rerolled
I-90A	8-22-72	"	"	"	"	"	"	"	"								116.7	13.7				114.6	14.9	-1.2	102	Recheck
I-91	8-25-72	"	16+25	15'RT	435	"	Main Emb	"	"								122.8	14.6				116.8	14.8	-0.2	105	
I-92	8-28-72	"	18+25	10'RT	434	"	"	"	"								123.5	15.5				118.0	13.7	+1.8	105	
I-93	"	"	17+75	10'LT	437	"	"	"	"								117.1	14.7				116.0	14.7	0	101	
I-94	8-29-72	"	14+15	U/S blanket	467	"	#2 Cofferdam	"	"								107.7	10.3				120.9	13.3	-3[illegible]	89	Plowed, watered, rerolled
I-94A	"	"	"	"	"	"	"	"	"								119.1	16.8				117.5	13.6	+3.2	101	Recheck
I-95	"	"	18+25	5'RT ~~Main E~~	440	"	Main Emb	"	"								114.7	15.6				115.0	14.9	+0.7	100	
I-96	8-31-72	"	17+75	10'RT	447	"	"	"	"								119.1	15.7				117.5	13.8	+1.9	101	

NOTE: (1) FILL IN APPROPRIATE WORD, DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ___

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E G: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906 IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST NOTE AS HS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E G: 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION E G: FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: [illegible signature]

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4030
JUN 67

(MAIN FORM)

(3) MonThL SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO
Dierks Dam	River: Saline; State: Ark; Town: Dierks	DACW-56-C-71-0151	Anis Const. Co.	9-5-72	15 — SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR	EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
1-2 ___ 3-4 ___ 5 ___ 6-7 ___ 8-9 ___ 10-13 ___	Random Earth	95	±3%	SFR	12	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	GRADATION: MAX PART SIZE (IN) (COL 11)	GRADATION: % PASSING #4 SIEVE (COL 12)	GRADATION: % PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	ATTERBERG LIMITS: PI (NOT PL) (COL 15)	IN-PLACE DATA TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE: WATER CONTENT (%) (COL 17)	-3/4 FRACTION: DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION: WATER CONTENT (%) (COL 19)	LABORATORY TEST DATA STANDARD METHOD: TEST (COL 20)	STANDARD METHOD: MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD: OPT WATER CONTENT (%) (COL 22)	RCCM: MAX DRY DENSITY (PCF) (COL 23)	RCCM: OPT WATER CONTENT (%) (COL 24)	FIELD AND LABORATORY CORRELATION: W % + OR − (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-125	8-14-72	WV	13+45	80'LT	441	12	Main Emb.	Reqd Excav.									124.6	11.4				122.8	11.4	0	102	
R-126	8-16	"	14+50	70'LT	449	"	"	"									119.6	13.5				121.6	13.1	+0.4	98	
R-127	"	"	13+45	90'LT	451	"	"	"									117.5	13.3				120.9	12.8	+0.5	97	
R-128	8-18	"	14+75	65'LT	458	"	"	"									125.2	11.3				123.3	11.6	-0.3	102	
R-129	8-21	"	14+00	70'LT	460	"	"	"									121.3	8.7				122.9	11.3	-2.6	96	
R-130	8-23	"	"	85'LT	465	"	"	"									134.6	8.5				129.0	9.2	-0.7	104	
R-131	8-25	"	16+25	75'RT	435	"	"	"									124.6	8.9				127.7	9.3	-0.4	98	
R-132	8-28	"	14+50	90'LT	469	"	"	"									126.9	9.1				126.1	10.0	-0.9	101	
R-133	8-29	"	18+40	30'RT	433	"	"	"									126.1	9.0				126.9	10.0	-1.0	99	
R-134	8-30	"	16+50	40'RT	440	"	"	"									135.9	10.3				124.1	10.8	-0.5	110	Results questionable
R-135	8-31	"	14+00	100'LT	469	"	"	"									121.4	15.3				116.5	14.5	+0.8	104	

NOTE: (3) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E G: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1908. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21 22 1- OR 3 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK E G 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION E G FOR COL 16 + COL 21 OR COL 23, INDICATE BY A OR B RESPECTIVELY. FOR COL 18 + COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ____
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT:	REPORT NO.
Dirks Dam	RIVER: Saline STATE: Ark TOWN: Dierks	DACW-38-C-71-0159	Amis Const. Co.	9-21-72	16 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious Core	95	+3 To -1	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	GRADATION: MAX PART SIZE (IN) (COL 11)	GRADATION: % PASSING #4 SIEVE (COL 12)	GRADATION: % PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	ATTERBERG LIMITS: PI (NOT PL) (COL 15)	IN-PLACE TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	IN-PLACE TOTAL SAMPLE: WATER CONTENT (%) (COL 17)	IN-PLACE -#4 FRACTION: DRY DENSITY (PCF) (COL 18)	IN-PLACE -#4 FRACTION: WATER CONTENT (%) (COL 19)	LAB STANDARD METHOD: TEST (COL 20)	LAB STANDARD METHOD: MAX D DENSITY (PCF) (COL 21)	LAB STANDARD METHOD: OPT WATER CONTENT (%) (COL 22)	LAB RCCM: MAX DRY DENSITY (PCF) (COL 23)	LAB RCCM: OPT WATER CONTENT (%) (COL 24)	FIELD AND LAB CORRELATION: W % + OR - (COL 25)	FIELD AND LAB CORRELATION: PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-97L	9-8-72	WV	14+00	℄	446	12	Main Emb.	Area "E"	CL			38.9	27.3				121.4	13.7				117.6	13.3	-0.4	103	
I-98	"	"	17+50	6' LT	452	"	"	"	"								117.5	12.1				122.2	11.9	+0.2	96	
I-99	9-12-72	"	14+75	10' RT	452	"	"	"	"								123.5	11.4				122.6	11.6	-0.2	101	
I-100	9-13-72	"	18+75	℄	456	"	"	"	"								118.9	12.0				119.1	12.3	-0.3	100	
I-101L(C)	9-20-72	"	18+50	10' RT	456	"	"	"	"			34.9	31.1				121.2	13.8	B	122.3	11.5	119.2	13.2	+0.6	102	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ (__)

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21 22 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

RCS: ENGCW-E-11(R1)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	River: Saline; State: Ark.; Town: Dierks	DACW-56-C-71-0159	Amis Const. Co.	9-21-72	16; Sheet 2 of 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SFR	12	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD MAX DRY DENSITY (PCF) (COL 21)	STANDARD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-136	9-1-72	WV	13+10	65'RT	434	12	Main Emb.	Req'd Excav									129.1	11.0				126.7	10.0	0	102	
R-137	"	"	15+20	100'LT	475	"	"	"									128.2	9.4				125.4	9.9	-0.5	102	
R-138	9-7-72	"	18+00	50'RT	451	"	"	"									117.4	11.8				119.6	14.0	-2.2	98	
R-139	"	"	16+25	85'RT	448	"	"	"									115.9	13.9				117.3	14.1	-0.2	99	
R-140 G	9-12-72	"	15+25	60'RT	448	"	"	"		3	83	36					115.5	11.3				119.8	12.5	-1.2	95	
R-141	"	"	14+50	125'RT	444	"	"	"									118.8	14.1				114.2	16.0	-1.9	102	
R-142	9-13-72	"	18+25	30'RT	452	"	"	"									121.0	12.1				123.0	11.8	+0.3	99	
R-143	9-15-72	"	13+25	80'RT	451	"	"	"									121.6	12.5				122.0	12.6	-0.1	100	
R-144	"	"	15+50	100'RT	453	"	"	"									125.5	11.6				124.8	11.6	0	101	
R-145	9-20-72	"	18+50	40'RT	456	"	"	"									121.0	15.9				116.7	15.3	+0.6	104	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL. 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ( )
COL. 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL. 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL. 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL. 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL. 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL. 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1902. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS (S) UNDER COL. 20 AND REPORT DETAILS OF PROCEDURE
COL. 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL. 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL. 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G.: 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC.
COL. 25 COL. 17 OR COL. 19 MINUS COL. 22 OR COL. 24
COL. 26 INDICATE DERIVATION, E.G.: FOR COL. 16 ÷ COL. 21 OR COL. 23 INDICATE BY A OR B, RESPECTIVELY; FOR COL. 18 ÷ COL. 21 OR COL. 23 INDICATE BY C OR D, RESPECTIVELY
COL. 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER ____
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY: L
RESIDENT ENGINEER

ENG FORM 4080

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

(MAIN FORM)

RCS: ENGCW-E-11(R1)

PROJECT.	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO.
Dierks DAM	Saline / Ark. / Dierks	DACW-56-C-71-0151	Amis Const. Co.	10-27-72	17

SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	-3 To +1	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (HOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	+ OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-102	9-22-72	WV	15+50	℄	459	12	Main Emb	Area "E"									123.7	11.6				120.6	12.4	-0.8	103	
I-103	9-27-72	"	12+00	245'LT	458	"	"	"									121.2	17.8				113.9	16.1	+1.7	106	
I-104	10-3-72	"	14+00	230'LT	504	"	"	"									118.6	13.7				115.8	14.7	-1.0	102	
I-105L	10-6-72	"	19+50	10'LT	471	"	"	"				27.0	34				114.8	12.5				117.2	13.9	-1.4	98	
I-106	"	"	20+25	10'RT	478	"	"	"									106.9	15.3				111.4	16.2	-0.9	96	
I-107	10-16-72	"	16+25	5'LT	461	"	"	"									110.6	17.8				112.7	15.8	+2.0	98	
I-108	"	"	14+00	10'RT	455	"	"	"									105.1	19.3				108.7	18.5	+0.8	97	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 5 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM) OTHER ____
COL 6 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS (X) UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(8) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO.
Dierks Dam	RIVER: Saline STATE: Ark. TOWN: Dierks	DACW-56-C-71-0159	Amis Const Co.	10-27-72	17 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (8)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±3	SFR	12	8	

TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	-#4 FRACTION 3/4 DRY DENSITY (PCF)	-#4 FRACTION 3/4 WATER CONTENT (%)	STANDARD METHOD TEST	STANDARD METHOD MAX. DRY DENSITY (PCF)	STANDARD METHOD OPT WATER CONTENT (%)	Rccm MAX DRY DENSITY (PCF)	Rccm OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
R-146	9-21-72	WV	17+00	60'RT	455	12	Main Emb	Spillway Excav									125.7	12.6				121.9	12.7	-0.1	96	
R-147	"	"	15+00	70'RT	450	"	"	"									128.4	11.0				123.7	11.4	-0.4	103	
R-148	9-22-72	"	15+25	130'RT	452	"	"	"									120.6	12.2				122.1	11.9	+0.3	99	
R-149	10-2-72	"	13+75	45'LT	464	"	"	"									114.2	16.9				117.6	16.7	+0.6	102	
R-150	10-3-72	"	16+00	60'LT	468	"	"	"									121.6	14.2				116.2	14.6	-0.4	105	
R-151	10-4-72	"	15+50	70'LT	476	"	"	"									121.9	12.5				118.0	14.2	-1.7	104	
R-152	10-9-72	"	15+00	90'LT	500	"	"	"									119.3	12.2				117.7	13.2	-1.0	101	

NOTE: (8) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
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COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E G: FOR COL 16 + COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 + COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER ____
CORPS OF ENGINEERS
PREPARED BY: [illegible signature]
SUBMITTED BY: ____
RESIDENT ENGINEER

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO.
Sierks Dam	River Saline; State Ark.; Town Dierks	DACW-56-C-71-0159	Amis Const. Co.	11-20-72	18; SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ______ 4-7 ______
3-4 ______ 8-9 ______
5— ______ 10-13 ______

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3 to -1	SFR	8	8	
Random	95	±3	"	12	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	-#4 MAX DRY DENSITY (PCF) (COL 23)	-#4 OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	D PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-101	11-15-72	WV	14+00		519	12	U/S Cofferdam	"E"									111.0	16.0				116.7	14.4	+1.6	95	
I-110L(c)	"	"	17+00		514	"	"	"									111.7	13.7	B	116.2	14.2	114.6	14.8	-1.1	98	
K-153	11-25-72	WV	13+50	125' RT	456	12	Main Emb.	Spillway Excav.									115.2	10.7				124.0	12.1	-1.4	95	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(1) ENTER TYPE OF EQUIPMENT USED, E.G., SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)
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COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G., AREA C, SPILLWAY EXCAVATION, ETC
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U S ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO
Lock's Dam	River: Saline; State: Ark; Town: Dierks	DACW 56-C	Ames Const. Co.	12-21-72	19; SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	% COL	FIELD % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	15	+3 -1	SFR	5	8	
Random Earth	15	±3	SFR	12	8	

	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	- #4 FRACTION DRY DENSITY (PCF) (COL 18)	- #4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	MAX DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	± (+ OR -) (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-111	11-29-72	WV	16+00		420.5	12	U/S Cofferdam	Area E	Red SC(E)								114.6	15.4				115.8	15.1	+0.3	99.0	
I-112	11-30	"	15+00	℄	457	"	Main Emb	"	"								107.5	20.4				112.2	17.5	+2.9	95.9	Reworked Watered
I-113	12-1	"	17+00	"	461	"	"	"	"								98.0	23.4				98.9	25.2	-1.4	99.1	
I-114	"	"	15+00	10' RT	458	"	"	"	"								115.5	13.9				114.9	14.3	-0.4	100.5	
I-115L	12-4	"	14+80	5' RT	461	"	"	"	Red SC	3/4	83	30	36.5	20.2			118.3	15.1				114.7	15.4	-0.3	103.2	
I-116	"	"	13+50	℄	461	"	"	"	Red SC(E)								119.4	13.3				122.4	13.2	+0.1	97.5	Watered
I-117	12-6	"	19+00	10' RT	464	"	"	"	"								115.6	16.0				108.8	17.7	-1.3	106.3	Reworked
											~~393~~	40														
R-154	11-27	"	16+60	75' LT	456	"	"	Spillway Excav.									115.7	14.4				121.4	13.5	+0.9	98.8	
R-155L	11-28	"	15+50	130' RT	451	"	"	"	Brown GC	3	100	24	27.2	13.1			121.0	10.7				124.2	12.2	-1.5	97.4	
R-156	11-29	"	15+75	85' LT	455	"	"	"	Brown GC(E)								123.1	8.6				121.5	10.5	-2	101.3	
R-157	11-30	"	13+50	110' RT	451	"	"	"	Brown GC(E)								124.2	14.3				119.8	14.0	+0.3	103.7	Too rocky to density
R-158	12-7	"	16+00	50' RT	463	"	"	"		4	97	21														"
R-159	12-16	"	18+00	75' RT	466	"	"	"		4	96	14														"
R-160G	"	"	15+50	90' LT	464	"	"	"		3	100	14														"
R-161	12-18	"	14+50	100' RT	454	"	"	"		4	86	17														"

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
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COL 3 — CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____
COL 5 — RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 — DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 — E.G.: AREA C, SPILLWAY EXCAVATION, ETC
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COL 25 — COL 17 OR COL 19 MINUS COL 22 OR COL 24
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U.S. ARMY ENGINEER ____
CORPS OF ENGINEERS
PREPARED BY: [signature]
SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	RIVER Saline; STATE Ark.; TOWN Dierks	DACW 56-C-71-0159	Amis Const. Co.	1-22-73	20; SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3 -1	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCC M MAX DRY DENSITY (PCF) (COL 23)	RCC M OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-118	12-21-72	WV	16+50	20' RT	463	12	Main Emb.	Area "E"	Red SC (E)								113.1	11.9				113.3	12.2	-0.3	99.8	
I-119	12-26	"	16+00	10' RT	466	"	"	"	"								116.6	15.0				114.6	15.0	0	101.7	
I-120 L(E)	12-27	"	13+25	℄	463	"	"	"	Red SC	1½	56.1	12.[illegible]	41.3	[illegible]			104.9	16.6	B	111.2	16.6	109.4	18.0	-1.4	95.8	
I-121	1-2-73	"	16+60	10' LT	470	"	"	"	Red SC (E)								107.5	16.3				110.6	16.7	-0.4	97.2	
I-122	"	"	14+50	℄	469	"	"	"	"								111.0	17.7				110.7	17.8	-0.1	100.2	
I-123	1-13	"	16+00	10' RT	470	"	"	"	"								113.4	18.3				111.3	17.5	+0.8	101.9	
I-124	1-16	"	11+00	℄	468	"	"	"	"			33.5	36.8	18.2			109.4	15.5				115.1	15.9	-0.4	102.6	
I-125L	1-19	"	15+50	℄	472	"	"	"	Red SC	1½	88.3	51.7	43.3	24.8			111.4	18.6				109.2	19.2	-0.6	102.0	
I-126	"	"	13+00	℄	470	"	"	"	Red SC (E)								110.1	17.6				111.5	16.8	+0.8	98.8	

NOTES: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
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COL 9 E G: AREA C, SPILLWAY EXCAVATION, ETC

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U S ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: J. Hillings[illegible]

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	RIVER: Saline; STATE: Ark.; TOWN: Dierks	DACW 56-C-71-0151	Ames Const Co.	1-22-73	20; SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random Earth	95	±2	SFR	12	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (FT) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-No. 3/4" FRACTION DRY DENSITY (PCF) (COL 18)	-No. 3/4" FRACTION WATER CONTENT (%) (COL 19)	TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-162	12-22-72	NV	14+00	75'RT	463	12	Main Emb	Spillway Excav.	Br GC(I)								119.5	14.1				121.4	13.8	+ 0.3	95.5	
R-163	"		15+00	50'RT	464				"								119.6	13.4				117.6	14.3	- 0.9	101.6	
R-164	12-27		16+25	130'RT	456				"								120.1	13.7				119.8	14.0	- 0.3	100.2	
R-165L	1-1-73		14+50	80'RT	462				Gr. SC			31.6	33.8	17.0			120.6	15.2				116.5	15.2	0	103.5	
R-166	"		18+50	130'RT	464				Gr SC(L)								115.2	15.7				116.2	15.1	+ 0.6	99.2	
R-167	1-2		13+00	100'RT	462				Br GC(I)								110.9	16.1				119.3	14.5	+ 1.6	94.7	
R-168	1-13		16+50	75'RT	467				"								123.5	13.3				120.5	12.7	- 0.6	102.5	
R-169	"		15+00	90'RT	466				"								117.6	12.6				121.0	12.9	- 0.3	97.1	
R-170G	1-15		17+00	70'RT	467					4	25	15														Too rocky To density
R-171	"		13+25	110'RT	464					"	30	20														"
R-172	"		15+00	"	458					"	29	18														"
R-173	1-16		15+00	80'RT	"					•	30	16														"
R-174	"		18+00	70'RT	470					•	30	15														"
R-175L	1-18		16+25	65RT	468					"	34	20.3	33.6	14.0												"
R-176	"		13+50	100'RT	465					•	51	20														"

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST
COL 9 E.G., AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE
COL 21-22 1 OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 23 AND 24, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY; FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ____
CORPS OF ENGINEERS
PREPARED BY: ____
SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(a) [illegible] SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dark's [illegible]	RIVER Saline STATE [illegible] TOWN [illegible]	[illegible]	[illegible]	2-21-73	21 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR	EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
1-2 3-4 5- 6-7 8-9 10-13							

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	[illegible] FRACTION DRY DENSITY (PCF)	[illegible] FRACTION WATER CONTENT (%)	TEST	STANDARD METHOD MAX DRY DENSITY (PCF)	STANDARD METHOD OPT WATER CONTENT (%)	[illegible] MAX DRY DENSITY (PCF)	[illegible] OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
[illegible]177	1-29-73	[illegible]	[illegible]+30	12' LT	477	12	[illegible]		[illegible] SC (E)								123.1	11.4				12[illegible].3	12.3	-1.7	95.5	
178	"		[illegible]	55 RT	"				[illegible] CL (E)								122.[illegible]	13.7				[illegible].3	13.6	+0.3	102.7	
179	"		[illegible]+75	[illegible] RT	475				[illegible] CL (E)								119.1	10.9				123.0	12.8	-1.9	96.8	
180(C)	[illegible]		[illegible]	30' LT	478				[illegible] CL			31.7	32.5	18.2			111.7	13.3	B	119.1	12.1	111.4	15.1	-1.8	91.6	
181	1-21		[illegible]	75' LT	477				Br CL (E)								117.3	12.7				122.9	[illegible]	+1.4	95.4	
182	1-31		[illegible]	110' LT	475				"								121.1	9.9				122.7	9.6	+0.3	94.1	
183	"		[illegible]	115 RT	"				[illegible] SC (E)								114.4	11.[illegible]				115.6	10.4	+1.9	99.0	
184	2-2		17+20	75' RT	479				Br CL (E)								123.3	13.5				122.7	13.5	0	100.4	
185(C)	"		14+10	30 LT	483				Br SC			✓	[illegible]	11.8			110.9	15.1				115.8	14.5	+0.6	95.7	
186	2-5		13+50	100' RT	475				[illegible] CL (E)								116.4	10.4				119.2	13.9	+0.5	97.7	
187	"		18+00	50' LT	480				[illegible] SC (E)								110.8	10.2				116.4	14.1	+2.1	95.3	
188	2-8		11+40	15 LT	482				[illegible] CL (E)								109.7	17.9				110.7	18.1	-0.2	99.1	
189	2-12		17+00	110' LT	478					4	3[illegible]	-														[illegible] density
190(C)	2-14		[illegible]	50' LT	488				Red SC			14	7.2	20.6			112.5	14.9	B	119.3	13.6	118.1	14.6	+0.3	95.3	
191	"		13+25	40' LT	491				Red SC (E)								113.3	14.7				117.4	15.0	-0.3	96.4	
192	2-20	"	12+30	75' RT	485				"								119.6	12.0				118.9	13.6	-1.6	100.5	

NOTES: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY, EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 1- OR 3 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22 MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER ____

CORPS OF ENGINEERS

PREPARED BY: [illegible]

SUBMITTED BY: ____

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(3) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT.	REPORT NO.
Dierks Dam	Saline / Ark / Dierks	DACW 56-C-71-0151	[illegible]	2-21-73	21 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ——— 6-7 ———
3-4 ——— 8-9 ———
5 ——— 10-13 ———

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT, THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3 -1	SFR	8	8	

TEST NO	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX PART SIZE (IN)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	TOTAL SAMPLE DRY DENSITY (PCF)	TOTAL SAMPLE WATER CONTENT (%)	-#4 ¾" FRACTION DRY DENSITY (PCF)	-#4 ¾" FRACTION WATER CONTENT (%)	TEST	STANDARD METHOD MAX DRY DENSITY (PCF)	STANDARD METHOD OPT WATER CONTENT (%)	RCCM MAX DRY DENSITY (PCF)	RCCM OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-127	1-29-73	WV	16+60	10' RT	482	12	Main Emb.	Area "E"	Red CL (E)								116.8	15.8				115.8	13.9	+1.9	100.9	
128	"	"	13+75	5' RT	"	"	" "	"	"								111.9	15.4				118.3	13.1	+2.3	94.6	
129	2-1	"	17+20	℄	481		" "	"	"								117.7	15.5				115.4	15.7	-0.2	101.9	
130(CC)	2-2	"	14+00	"	482	"	" "	"	Red SC	3		37.4	42.4	21.8			111.7	16.6	B	113.3	15.8	112.8	16.3	+0.3	98.9	
131	2-8	"	15+00	"	483	"	" "	"	Red SC (E)								106.6	18.8				108.0	17.8	+1.0	98.9	
132	2-20	"	11+90	10' RT	486	"	" "	"	"								110.5	18.6				113.9	16.5	+2.1	97.0	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK), SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ________ ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E G: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

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COL 21-22 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22 MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED STATE HOW ESTIMATED BY FILLING IN BLANK, E G: 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E G FOR COL 16 ÷ COL 21 OR COL 23 INDICATE BY A OR B, RESPECTIVELY FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED DENOTE BY (R)

U S ARMY ENGINEER ________
CORPS OF ENGINEERS

PREPARED BY: [illegible signature]

SUBMITTED BY: ________
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

(MAIN FORM)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO.
Dierks Dam	Saline / Ark / Dierks	DACW 56-C 71-4151	Amis Const Co.	3-20-73	22

SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	-2	SFR	12	8	
Impervious	95	+3 -1	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	RCCM MAX DRY DENSITY (PCF) (COL 23)	RCCM OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-193	2-27-73	WV	18+00	10' RT	485	12	Main Emb	Borr E	Red SC(E)								117.5	15.7				116.7	16.9	-1.2	100.7	
194	"	"	14+30	5' RT	484	"	"	"	Br SC(E)								119.5	13.6				121.0	13.4	+0.2	98.9	
195	2-28	"	16+40	50' LT	490	"	"	"	Br SC	1½	41.2	17.5	31.7	13.1			117.8	13.1				116.7	12.0	+1.1	100.7	
T-133	2-28	"	16+50	℄	489	"	"	"	Red SC(E)								109.1	17.5				113.2	17.5	0	96.4	
134	3-1	"	16+20	5' RT	490	"	"	"	Red ML(E)								111.7	14.4				116.0	12.6	+1.8	96.3	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E G: SHEEPSFOOT ROLLER (SFR) PNEUMATIC ROLLER (PR) VIBRATORY ROLLER (VR) PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ______ ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 E G: AREA C SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN -DIAM MOLD, (B) 6-IN -DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS HS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK E G: 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E G FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U S ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: [illegible signature]

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(1) [illegible] SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT: [illegible] Dam	RIVER: [illegible] STATE: [illegible] TOWN: [illegible]	CONTRACT NO. [illegible]	CONTRACTOR. [illegible]	DATE OF REPORT: 4-23-73	REPORT NO.: 23 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
[illegible]	[illegible]	[illegible]	[illegible]	12	8	
Impervious	[illegible]	+3 -1	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	FRACTION DRY DENSITY (PCF) (COL 18)	FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX. DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	MAX. DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
[illegible]-196	3-20-73	[illegible]	[illegible]	70 RT	[illegible]	12	[illegible]	[illegible]	SC (C)								[illegible]	[illegible]				11[illegible].7	[illegible]	[illegible]	94.2	
197	3-21		[illegible]	85 RT	"				GC (C)								11[illegible].4	[illegible]				[illegible]	13.5	-[illegible].3	97.2	
198	"		13+3[illegible]	[illegible]	45[illegible]				SC (C)								11[illegible].4	[illegible]				11[illegible]	14.1	-1.4	94.0	
199	3-22		[illegible]	60 RT	[illegible]				[illegible] (C)								[illegible]	11.2				110.2	11.5	-0.3	97.4	
200 (R)	3-23		15+50	120 RT	438				[illegible]	1½	65.4	[illegible]	[illegible]7	14.9			108.2	[illegible]	B	110.4	17.5	10[illegible]	1[illegible].9	-[illegible].2	9[illegible]	
201	"		13+[illegible]	50 LT	475				SC (C)								[illegible]7.4	[illegible]				112.9	15.5	-1.6	9[illegible]	
202	4-2		17+5[illegible]	45 LT	499				"								[illegible]4	[illegible]				[illegible]2.6	13.0	+[illegible]	95.4	
203	4-3		14+[illegible]	70 RT	4[illegible]												[illegible]0	2[illegible].6				113.2	1[illegible].7	+1.9	9[illegible]	
204	"		[illegible]	50 RT	4[illegible]				"								[illegible]2.4	21.7				105.7	21.5	-0.2	9[illegible]	
205 (R)	4-4		15+[illegible]	50 LT	500					[illegible]		24.[illegible]					108.8	18.7	[illegible]			108.2	19.5	-0.8	10[illegible].6	
206	4-5		13+[illegible]	40 LT	[illegible]				SC (C)								112.3	12.[illegible]				118.7	13.8	-1.5	94.[illegible]	
207	"		14+[illegible]	60 LT	[illegible]				SC (C)								105.2	17.[illegible]				108.7	17.8	-1.7	96.7	
208	4-6		13+30	75 RT	[illegible]				[illegible] (C) and GC (C)								123.7	11.9				122.6	12.0	-0.1	100.9	Test inaccurate Too rocky
209	4-9		11+30	60 RT	"				"								114.4	10.2				127.6	10.6	-[illegible].4	89.7	Test inaccurate Too rocky
210	4-10		13+50	50 LT	[illegible]2				"			[illegible]			[illegible] 3/4		110.0	11.2	B	118.7	13.0	115.8	11.0	+0.1	87.3	Too rocky for density
210A	4-11		"	"	"							[illegible]2.1														

NOTES: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL), CHUNK (CH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)
COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22 1 OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: [illegible signature]

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R5)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam	River: Saline; State: Ark.; Town: Dierks	DACW66-C-71-0159	Ames Const. Co.	4-23-73	23; Sheet 2 of 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 4-7 ____
3-6 ____ 8-9 ____
5- ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS AND OR LETTER SYMBOL (COL 10)	GRADATION: MAX PART. SIZE (IN.) (COL 11)	GRADATION: % PASSING #4 SIEVE (COL 12)	GRADATION: % PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	ATTERBERG LIMITS: PI (NOT PL) (COL 15)	IN PLACE TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	IN PLACE TOTAL SAMPLE: WATER CONTENT (%) (COL 17)	IN PLACE -#4 FRACTION: DRY DENSITY (PCF) (COL 18)	IN PLACE -#4 FRACTION: WATER CONTENT (%) (COL 19)	STANDARD METHOD: TEST (COL 20)	STANDARD METHOD: MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD: OPT WATER CONTENT (%) (COL 22)	RCM: MAX DRY DENSITY (PCF) (COL 23)	RCM: OPT WATER CONTENT (%) (COL 24)	W % + OR − (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-211	4-12-73	WV	16+50	10'LT	504	12	Main Emb.	Area "E"	Br SC(E)								116.9	17.5				110.1	17.6	− 0.1	97.1	
I-135(E)	3-20		17+50	℄	491				Red CL	1	88.7	51.0	39.7	17.2			112.7	15.1				114.0	15.2	− 0.1	98.8	
-136	3-22		13+50	8'RT	492				Red SC(E)								117.7	14.4				118.5	14.0	+ 0.4	99.3	
137	4-2		12+50	12'RT	495				"								114.0	15.5				114.3	16.8	− 0.3	99.8	
138(RS)	4-4		15+00	℄	499					1	-	53.5					108.6	18.0				108.9	17.7	+ 0.3	99.1	
139	4-6		18+50	8'RT	501				Red SC(E)								110.7	18.3				110.1	17.6	+ 0.7	100.5	
140 (E)	4-9		14+00	℄	501					1½	-	43.3					109.0	15.9	B	113.7	14.7	114.2	15.8	− 0.1	95.4	
141	4-12		18+50	11'RT	502				Br SC(E)								104.2	21.0				105.4	20.9	+ 0.1	98.9	

Atterberg Limits incomplete
R-205, 210
I 138, 140

NOTES: (1) FILL IN APPROPRIATE WORD, DAILY, WEEKLY, MONTHLY, OR PERIODIC.
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT).

COL 3 CYLINDER (CYL), CHUNK (CH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPEAT DETAILS OF PROCEDURE.

COL 21-22 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R)

U. S. ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: [illegible signature]

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(8) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT:	REPORT NO.:
Hicks Dam	River: Saline; State: Ark.; Town: Hicks	[illegible]	[illegible] Const. Co.	5-23-73	24

SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2 ___ 3-4 ___ 5 ___ 6-7 ___ 8-9 ___ 10-13 ___

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (B)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	±2	SFR	12	5	
Impervious	95	+3 −1	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	−#4 FRACTION DRY DENSITY (PCF) (COL 18)	−#4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	MAX. DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	MAX. DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR − (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
C-212	5-5-73	WV	15+50	20' RT	512	12	Main Emb	Area "X"	Br. SC (E)								112.3	13.[illegible]				112.6	15.6	−2.0	99.7	
213	"		15+10	50' RT	505				Br. SC (E)								115.7	11.3				114.5	11.1	+0.2	101.1	
214	5-8		14+00	40' LT	510				"								107.2	13.7				118.5	14.0	−0.3	96.0	
215(L)	"		12+40	40' RT	505				Br SC	1	84.8	43.5	24.3	15.6			110.5	11.4				115.4	11.3	+0.1	95.7	
216	5-9		17+50	40' RT	507				Lt. CL (E)								108.1	18.0				105.6	20.0	−2.0	102.3	
217	"		17+50	40' LT	510				"								105.9	17.8				106.7	19.6	−1.8	99.1	
218	5-10		19+15	35' LT	509				Gray SM (E)								116.2	13.9				118.7	12.5	+1.4	97.9	
219	5-14		18+00	70' LT	512				Br. SC (E)								107.7	17.6				110.1	18.0	−0.3	97.8	
220(L)	"		12+40	10' LT	512												105.3	19.4	B	107.7	19.7	106.8	19.8	−0.4	98.6	
221	5-15		17+00	80' RT	508				Br CL (E)								104.0	18.3				106.9	18.5	−0.2	97.2	
222	"		20+50	40' LT	516				"								101.7	11.7				105.8	11.8	−0.1	96.1	
223	5-16		15+50	70' LT	514				Br. SC (E)								109.3	14.7				108.8	16.1	−1.4	100.5	
224	5-17		11+75	50' RT	512				Gray SC (E)								115.1	14.3				121.6	11.3	+3.0	94.7	
225(L)	"		17+50	45' RT	512												103.2	18.8				106.9	19.5	+0.7	96.5	
226	5-18		15+00	35' LT	513												108.2	15.5				109.9	17.3	−1.8	98.5	

NOTE: (A) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(B) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL. 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM) OTHER ____

COL. 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.

COL. 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL. 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.

COL. 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL. 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL. 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL. 21-22 1-OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL. 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC

COL. 25 COL 19 OR COL 19 MINUS COL 22 OR COL 24

COL. 26 INDICATE DERIVATION, E.G. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.

COL. 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED DENOTE BY (R)

U S ARMY ENGINEER ____

CORPS OF ENGINEERS

PREPARED BY: [illegible signature]

SUBMITTED BY: ____

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	RIVER: Saline STATE: Ark. TOWN: Dierks	DACW 38-C-71-1.9	Arus Const Co	5-23-73	24 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	GRADATION: MAX PART SIZE (IN) (COL 11)	GRADATION: % PASSING #4 SIEVE (COL 12)	GRADATION: % PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	ATTERBERG LIMITS: PI (NOT PL) (COL 15)	IN-PLACE TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	IN-PLACE TOTAL SAMPLE: WATER CONTENT (%) (COL 17)	IN-PLACE -3/4 FRACTION: DRY DENSITY (PCF) (COL 18)	IN-PLACE -3/4 FRACTION: WATER CONTENT (%) (COL 19)	LAB STAND. METHOD: TEST (COL 20)	LAB STAND. METHOD: MAX. DRY DENSITY (PCF) (COL 21)	LAB STAND. METHOD: OPT WATER CONTENT (%) (COL 22)	LAB RCCM: MAX DRY DENSITY (PCF) (COL 23)	LAB RCCM: OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-142	5-5-73	WV	18+50	6 RT	504	12	Lhn Ench	Area "X"	Red SC (E)								109.2	16.7				112.7	16.7	0	97.0	
143	5-8		12+50	10' RT	507				Red CL (E)								105.0	19.1				110.5	16.9	+ 2.2	95.1	
144	5-9		17+50	℄	508				Red SC (E)								120.7	14.0				117.5	13.7	+ 0.3	102.8	
145 (L)	5-10		19+10	5' RT	513				Red CL	1	93.8	72.4	27.3	12.9			110.8	15.0				112.3	15.2	0	98.6	
146	5-16		13+00	5 RT	512				Red CL (E)								109.7	14.8				113.6	14.9	- 0.1	96.8	
147	5-18		15+00	10' RT	513				Red SC (E)								119.7	12.6				122.0	11.2	+ 1.4	98.1	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM) OTHER ________

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ____________

CORPS OF ENGINEERS

PREPARED BY: [signature]

SUBMITTED BY: ____________

RESIDENT ENGINEER

ENG FORM 4010
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-17(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam	River: Saline State: Ark. Town: Dierks	DACW 54-C-71-0159	Amis Cnst. Co	5-27-73	25 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (3)	LOOSE LIFT THICKNESS (IN)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	±3	SFR	12	8	
Impervious	95	+3-1	SFR	8	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE L Y DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 FRACTION WATER CONTENT (%) (COL 19)	TEST (COL 20)	STANDARD METHOD MAX DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	MAX DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-227	5-22-73	W.V.	14+40	50' Lt.	515	12	Main Emb	Area X	Br. S.C(E)								103.9	14.3		~~[illegible]~~	~~[illegible]~~	106.3	20.6	-1.3	97.7	
R-228	"		17+75	41' Lt.	519				"								112.7	13.7				116.3	14.6	-0.9	96.9	
R-229	5-23-73		15+50	45' Lt.	515				Br. C.L (E)								109.3	13.0				115.4	14.9	-1.9	94.7	
R-230(C)	5-24-73		13+30	50' Lt.	528				Rd S.C.	2	88.2	42.6	34.3	17.0			114.8	13.2	B.	118.3	12.9	116.1	14.1	-1.2	98.9	
R-231	"		18+50	35' Lt.	519																					Too Rocky For Density
R-232	5-25-73		15+25	35' Lt.	527				Br. S.C(E)								101.6	21.0				105.7	20.5	+0.5	96.1	
R-233	5-30-73		13+50	35' Rt.	518				"								101.7	18.6				106.2	19.2	-0.6	95.8	
R-234	5-31-73		18+10	20' Lt.	520				Br. S.C(E)								106.5	14.6				112.2	16.4	-1.8	94.9	
R-235(C)	"		E+00	50' Rt.	518				Br. S.C.	1	98.5	55.3	22.9	7.7			107.1	15.2				112.3	15.6	-0.4	95.4	
R-236	6-1-73		17+50	25' Lt.	520				Br. CL(E)								109.2	13.6				114.8	13.6	0	95.2	
R-237	6-8-73		15+50	35' Lt.	519																					Too Rocky For Density
R-238	"		14+50	30' Lt.	520				Br. S.C(E)								117.0	17.5				114.6	17.6	-0.1	94.7	
R-239	6-5-73		24+00	40' Lt.	528				Br. CL(E)								113.0	15.8				114.5	15.7	+0.1	98.6	
R-240(C)	"		15+00	40' Rt.	519				Br. CL.	1	78.9	57.7	38.2	17.4			111.2	13.8	B.	116.5	12.7	114.9	16.5	-2.7	96.8	Record Sample.
R-241	6-11-73		15+00	25' Lt.	522				Br. S.C(E)								110.6	14.6				116.3	14.8	-0.2	95.0	
R-242	6-14-73		17+75	40' Lt.	522			Dark Br.	S.C(E)								114.3	13.6				114.1	15.2	-1.6	100.2	
R-243	6-15-73		13+50	40' Lt.	521				Rd. S.C(E)								104.8	23.3				110.2	23.7	-0.4	95.1	
R-244	"		E+75	30' Lt.	522				Gr. G.C(E)								110.7	18.1				113.3	18.9	-0.8	97.7	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(3) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATOR / TAMPER (T)

COL. 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM) OTHER ____ ( )

COL. 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTER LINE OF DAM OR RIGHT OR LEFT OF AXIS

COL. 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL. 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL. 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E)

COL. 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL, LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY, FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U.S. ARMY ENGINEER ____

CORPS OF ENGINEERS

PREPARED BY: W.A. McGuire Jr.

SUBMITTED BY: ____

RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT	RIVER / STATE / TOWN	CONTRACT NO	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks Dam	RIVER: Saline STATE: Ark TOWN: Dierks	DACW 38-C-71-0159	Amis Cnst. Co	5-27-73	25 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5, 6-7, 8-9, 10-12

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	-3 -1	SFR	8	8	

TEST NO (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	MAX DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	MAX DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-148	5-22-73	NV	15+60	℄	514	12	Main Emb	Area X	Red S.C(E)								113.1	14.2				114.2	15.2	-0.9	99.1	
I-149	5-28-73		17+00	℄	517				"								114.1	15.2				116.3	15.5	-0.2	98.1	
I-150(C)	5-30-73		13+50	℄	518				Red S.C	1	89.9	49.0	27.4	13.5			118.0	14.5				117.6	13.5	-1.0	100.4	
I-151	6-1-73		20+00	℄	521				Dark Br. S.C	1	89.1	43.4	3.8	16.1			113.2	14.8				114.5	15.3	-0.5	98.8	Record Sample
I-152	6-8-73		15+50	℄	519				Red C.L(E)								113.0	14.2				119.0	13.7	+0.5	94.9	
I-153	6-11-73		22+50	℄	532				"								117.3	13.0				120.9	12.1	+0.9	97.1	
I-154	6-13-73		17+00	℄	522				"								118.0	14.7				119.8	14.7	+0.4	98.5	
I-155(C)	6-14-73		12+75	10'Rt.	522				Br. S.C(E)	1	80.0	44.3	27.1	12.9			118.6	11.2				124.3	11.4	-0.2	95.4	

NOTES: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL) CHUNK (CK) SAND VOLUME (SV) WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ______ ( ).

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 2 POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23 INDICATE BY C OR D, RESPECTIVELY

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: W.F. McElwing Jr.

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: / STATE: / TOWN:	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam	Saline / Ark. / Dierks	DACW56-C-71-0159	Amis Cnst Co.	23 July 1973	26. SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR: 1-2, 3-4, 5-, 6-7, 8-9, 10-13

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	±3	SFR	12	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART. SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	MAX. DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	MAX. DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR − (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-245(c)	6-21-73	W.V.	16+20	35'Lt.	527	12	Main Emb	Area X	Br. SC (F)	2	73.5	37.3	27.7	12.0			118.8	13.9				113.6	15.7	-1.8	96.8	
R-246	"		14+00	60'Rt.	522				Br. SC								107.6	16.1				112.7	15.8	+0.3	95.5	
R-247	6-22-73		17+50	35'Rt	526				Br+Gr SC(F)								110.4	14.3				115.2	15.5	-1.2	95.8	
R-248	6-25-73		20+00	35'Lt.	526				"								113.5	15.0				114.3	15.3	-0.3	99.2	
R-249	"		19+50	40'Rt.	525				Br G.C (F)								108.5	14.5				113.3	15.4	-0.9	95.8	
R-250(C)	6-26-73		14+00	20'Lt.	527				Gr+Br. S.C.	2	79.4	42.9	26.7	12.9			115.6	14.0	B	117.0	14.9	114.9	15.2	-1.2	100.6	
R-251	"		15+25	30'Rt.	525				Gr+Br SC(F)								103.1	17.3				107.0	19.2	-1.9	96.3	
R-252	6-27-73		15+50	35'Lt.	528				"								120.0	11.0				122.3	12.2	-1.2	98.1	
R-253	7-2-73		17+20	30'Rt.	531				Br.S.C. (F)								102.6	18.2				101.8	18.4	-0.2	97.0	
R-254	"		13+25	35'Rt.	529				Br+Gr. S.C.(F)								116.6	11.0				123.2	11.7	-0.7	94.7	
R-255(E)	7-4-73		16+00	30'Lt.	531				Br+Gr. SC.	1	59.3	31.0	34.8	14.5			106.9	16.1				109.8	18.2	-2.1	97.3	
R-256	"		19+00	40'Rt.	531				Br+Gr. S.C.(F)								107.4	15.6				111.3	17.0	-1.4	96.5	
R-257	7-12-73		18+50	35'Lt.	533				Br.G.C. (F)								118.2	13.1				121.5	13.1	0	97.3	
R-258	"		15+00	30'Rt.	532				Br.S.C. (F)								118.0	14.1				118.7	14.1	0	99.4	
R-259	"		15+00	25'Lt.	532				Br.S.C (F)								110.1	16.9				109.8	18.0	-1.1	100.2	
R-260(C)	7-14-73		22+50	40'Rt.	535					1	71.6	29.9	59	5.1			101.7	17.2	B	111.2	15.3	106.8	19.8	-2.6	95.2	
R-261	"		13+50	35'Rt.	535				Br B.C (F)								114.6	17.2				113.2	16.2	+1.0	101.2	
R-262	"		16+50	25'Lt.	524				Br.SC (F)								119.3	14.1				118.8	14.4	-0.3	100.4	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC.
(1a) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____ ( ).

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 + COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 + COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: H.H. McFerrin Jr

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4030
JUN 67

(MAIN FORM)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks, Dam	RIVER: Saline STATE: Ark. TOWN: Dierks	DACW 56-C-71-C159	Amis Const. Co.	23 July 1973	26 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5- ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3 to -1	S.F.R.	8	8	

TEST NO. COL 1	DATE MADE COL 2	TYPE TEST COL 3	STATION COL 4	OFFSET (FT) COL 5	ELEVATION (FT) COL 6	DEPTH (IN.) COL 7	EMBANKMENT ZONE COL 8	BORROW SOURCE COL 9	CLASS WORD OR LETTER SYMBOL COL 10	MAX PART. SIZE (IN.) COL 11	% PASSING #4 SIEVE COL 12	% PASSING #200 SIEVE COL 13	LL COL 14	PI (NOT PL) COL 15	TOTAL SAMPLE DRY DENSITY (PCF) COL 16	TOTAL SAMPLE WATER CONTENT (%) COL 17	-#4 FRACTION DRY DENSITY (PCF) COL 18	-#4 FRACTION WATER CONTENT (%) COL 19	TEST COL 20	STANDARD METHOD MAX. DRY DENSITY (PCF) COL 21	STANDARD METHOD OPT WATER CONTENT (%) COL 22	MAX DRY DENSITY (PCF) COL 23	OPT WATER CONTENT (%) COL 24	W % ... COL 25	PERCENT COMPACTION COL 26	COMMENTS ON TESTS COL 27
T-156	6-22-73	W.V.	17+50	5' Rt.	527	12	Main Emb.	Area X	Red S.C.(E)	1							116.9	11.7				122.8	11.8	-0.1	95.1	
T-157	6-25-73		19+75	℄	526				Red C.L (E)								121.7	12.8				120.8	12.9	-0.1	100.7	
T-158	6-27-73		15+50	5' Lt.	528				Br. S.C. (E)								125.2	11.5				124.7	10.9	+0.6	100.4	
T-159	7-3-73		20+75	5' Rt.	532				Red S.C. (E)								119.9	14.0				118.7	13.8	-0.2	101.0	
T-160(C)	"		14+00	℄	532				Red S.C.	1	84.1	38.1	28.3	13.3			115.5	14.1	B	119.3	13.0	118.6	14.0	-0.1	97.4	
T-161	7-17-73		15+00	10' Rt.	534				Red S.C. (E)								122.0	13.9				119.3	13.4	+0.5	102.3	
T-162	"		17+50	10' Rt.	534	.			Red S.C. (E)								114.3	13.5				119.7	13.4	+0.1	95.4	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(1) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT).
COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____ ( ).
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)
COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: W.L. McGarvin Jr.

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(1) Monthly. SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

(MAIN FORM) RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN:	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam.	RIVER: Saline; STATE: Ark.; TOWN: Dierks, Ark.	DACW 56-C-71-0159	Amis Const. Co.	23 Aug 1973	27 SHEET 1 OF 21

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED ± LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	±3	SFR	12	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	TEST (COL 20)	STANDARD METHOD MAX. DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	MAX DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR − (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-263	7-24-73	N.V.	12+90	25' Rt.	535	12	Above End Area X										~~96.7~~	~~17.7~~								Too Rocky for Density
R-264	"		16+00	25' Lt.	535				Gr. GC (E)								96.7	17.4				101.9	14.7	+1.8	94.9	
R-265(E)	7-26-73		15+50	25' Rt.	535																					Too Rocky for Density
R-266	7-27-73		19+00	30' Rt.	535				Gr. G.C. (E)								95.4	21.0				100.8	23.2	-2.2	94.6	
R-267	"		21+50	30' Rt.	535				Rd SC (E)								111.6	11.2				114.1	14.1	-2.9	97.8	
R-268	8-1-73		13+00	35' Lt.	537				Br. SC (E)								101.6	22.2				103.3	21.4	+0.8	98.4	
R-269	"		19+25	30' Rt.	538				Br. SC (E)								112.3	16.2				113.9	16.3	-0.1	98.6	
R-270(C)	8-3-73		18+50	35' Lt.	539				Rd SC.	2	55.2	25.7	20.0	11.7			111.9	14.4	B	117.2	13.6	116.1	15.1	-0.7	96.4	
R-271	8-6-73		12+00	25' Rt.	540				Br. G.C. (E)								112.9	16.9				113.2	17.3	-0.4	99.8	
R-272	8-9-73		15+00	40' Lt.	540				Br. S.C	2	86.0	44.0	33.1	15.6			105.1	16.5				109.0	18.3	-1.8	96.4	Record Sample
R-273	8-13-73		15+00	20' Lt.	541				Br. S.C (E)								106.4	14.9				112.4	16.8	-1.9	94.6	
R-274	"		16+00	20' Rt.	541				Br. SC (E)								104.7	16.0				108.6	18.5	-2.5	96.3	
R-275(E)	8-14-73		23+00	20' Lt.	541				Br. S.C	2	74.6	36.5	21.3	8.1			108.6	14.2				112.5	16.0	-1.8	96.5	
R-276	"		24+00	20' Rt.	541				Gr. SC (E)								109.5	15.2				110.7	17.4	-2.2	98.9	
R-277	8-15-73		16+00	35' Rt.	542				Br. SC (E)								110.0	15.4				111.6	17.5	-2.1	98.4	
R-278	"		15+50	30' Lt.	542				"								107.6	16.2				112.7	16.2	+0.0	95.5	
R-279	8-16-73		20+00	30' Lt.	542				"								108.7	18.0				103.3	20.3	-2.3	105.3	
R-280(E)	8-20-73		16+50	20' Rt.	543				Br. S.C	2	62.0	17.3		N.P.			122.6	11.0	B	127.3	6.6	[illegible]	[illegible]	[illegible]	[illegible]	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT).

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____ ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER ____

CORPS OF ENGINEERS

PREPARED BY: W.H. McGinnis Jr.

SUBMITTED BY: ____

RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(MAIN FORM)

(1) Monthly. SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: / STATE: / TOWN:	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam	RIVER: Saline STATE: Ark. TOWN: Dierks.	DACW-56-C-71-157	Amis Const. Co	23 July 1973	27 SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 — 3-4 — 5— 6-7 — 8-9 — 10-13 —

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious.	95	±3 (+-)	SFR	8	8	

TEST IDENTIFICATION									CLASSIFICATION	GRADATION			ATTERBERG LIMITS		IN-PLACE DATA: TOTAL SAMPLE		IN-PLACE DATA: -#4 3/4 FRACTION		LABORATORY TEST DATA: STANDARD METHOD					FIELD AND LABORATORY CORRELATION		
TEST NO.	DATE MADE	TYPE TEST	STATION	OFFSET (FT)	ELEVATION (FT)	DEPTH (IN)	EMBANKMENT ZONE	BORROW SOURCE	CLASS WORD OR LETTER SYMBOL	MAX. PART. SIZE (IN.)	% PASSING #4 SIEVE	% PASSING #200 SIEVE	LL	PI (NOT PL)	DRY DENSITY (PCF)	WATER CONTENT (%)	DRY DENSITY (PCF)	WATER CONTENT (%)	TEST	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	MAX. DRY DENSITY (PCF)	OPT WATER CONTENT (%)	W % + OR -	PERCENT COMPACTION	COMMENTS ON TESTS
COL 1	COL 2	COL 3	COL 4	COL 5	COL 6	COL 7	COL 8	COL 9	COL 10	COL 11	COL 12	COL 13	COL 14	COL 15	COL 16	COL 17	COL 18	COL 19	COL 20	COL 21	COL 22	COL 23	COL 24	COL 25	COL 26	COL 27
I-163	7-24-73	NUV	16+00	10' Lt.	535	12	Main Emb.	Area X	Red S.C (E)								120.7	12.7				120.3	14.1	-1.4	100.3	
I-164	7-31-73		15+50	℄	536				Red S.C. (E)								121.9	11.2				123.6	11.0	+0.2	98.6	
I-165(L)	8-2-73		18+00	5' Lt.	538				Red S.C/CL	1	73.9	35.1	35.1	—			119.5	13.3				119.3	13.5	-0.2	100.1	
I-166	8-9-73		15+00	℄	539				Red C.L	1	86.4	59.2	24.7	6.0			116.6	14.1				119.5	13.8	+0.3	97.5	Record Sample.
I-167	8-13-73		15+50	℄	541				Red S.C (E)								122.2	13.9				119.3	13.7	+0.2	102.4	
I-168	8-14-73		23+50	℄	541				Red S.C (E)								123.5	12.5				120.9	12.8	-0.3	102.1	
I-169	8-16-73		15+20	℄	542				Red S.C (E)								122.0	11.7				122.9	11.8	-0.1	99.3	
I-170	8-20-73		20+50	℄	543				Red SC	1	96.5	44.7	27.5	11.2			117.6	12.7	B	121.7	12.9	120.5	12.9	-0.2	97.6	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC.
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT).

COL 3 — CYLINDER (CYL), CHUNK (CH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ______ ( ).
COL 5 — RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 — DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 9 — E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL 10 — ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E).
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COL 27 — IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: W. H. McFerrin, Jr.

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(a) MONTHLY SUMMARY OF FIELD COMPACTION CONTROL ~~OF IMPERVIOUS~~ OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.	CONTRACTOR	DATE OF REPORT	REPORT NO.
Dierks DAM	RIVER: SALINE STATE: ARKANSAS TOWN: DIERKS, ARKANSAS	DACW 56-C-71-0159	AMIS CONST. CO.	21 SEPT. 1973	28 SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
RANDOM	95	±3	SHEEPSFOOT ROLLER	12	8	
IMPERVIOUS	95	+2 TO -1	SHEEPSFOOT ROLLER	8	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	GRADATION: MAX. PART SIZE (IN.) (COL 11)	GRADATION: % PASSING #4 SIEVE (COL 12)	GRADATION: % PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	ATTERBERG LIMITS: PI (NOT PL) (COL 15)	IN-PLACE TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	IN-PLACE TOTAL SAMPLE: WATER CONTENT (%) (COL 17)	IN-PLACE -3/4 FRACTION: DRY DENSITY (PCF) (COL 18)	IN-PLACE -3/4 FRACTION: WATER CONTENT (%) (COL 19)	STANDARD METHOD: TEST (COL 20)	STANDARD METHOD: MAX. DRY DENSITY (PCF) (COL 21)	STANDARD METHOD: OPT WATER CONTENT (%) (COL 22)	MAX. DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT OF COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-281	8-28-73	W.V.	20+50	20' LT	545	12	MAIN EMBANK.	AREA "X"	(E) BR. S.C								122.5	12.2				122.9	11.8	+0.4	99.6	
R-282	"		20+40	30' RT	546				(E) BR. G.C								124.9	9.2				130.8	11.4	-2.2	95.5	
R-283	8-29-73		13+60	35' LT	546				(E) BR. S.C								124.8	10.2				125.3	10.6	-0.4	99.6	
R-284	"		17+00	25' LT	546				(L) BR. S.M								124.3	8.6				126.1	9.9	-1.3	98.6	
R-285(L)	8-31-73		14+00	25' LT	547																					TOO ROCKY FOR DENSITY
R-286	"		14+00	25' RT	547																					TOO ROCKY FOR DENSITY
R-287	9-4-73		23+50	40' LT	549				(L) BR. G.C								126.8	10.9				125.4	11.1	-0.2	101.1	
R-288	"		22+00	40' DS	549				(L) BR. G.C								121.6	8.5				127.1	9.8	-1.3	95.6	
I-171	8-22-73	W.V.	22+00	5' LT	544	8	MAIN EMBANK.	AREA "X"	(E) RED. C.L								119.6	11.6				122.8	11.9	-0.3	97.4	
I-172	"		18+50	5' LT	549				(E) [illegible] S.C.								124.2	10.8				121.3	12.2	-1.4	102.4	
I-173	9-11-73		19+50	℄	550				(E) RED. S.C								117.6	12.3				122.3	12.2	+0.1	96.2	
I-174	"		22+50	℄	550				(L) BR. C.L.								113.9	15.2				120.1	12.1	+3.1	94.8	
I-175	9-21-73		11+25	℄	560												100.6	25.7				95.9	25.7	[illegible]	104.8	L.L. + [illegible] Test not completed

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC.
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COL. 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM) OTHER ____
COL. 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.
COL. 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL. 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.
COL. 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E).
COL. 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S.
COL. 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL. 20 AND REPORT DETAILS OF PROCEDURE.
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COL. 25 COL. 17 OR COL. 19 MINUS COL. 22 OR COL. 24.
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U. S. ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: Simpson S. Hill

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

(1) Monthly — SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS — RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam	RIVER: Saline; STATE: Arkansas; TOWN: Dierks	DACW-56-C-71-C159	Ands Const. Co	22 Oct 1973	29; SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 6-7 ____
3-4 ____ 8-9 ____
5- ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	±3	Sheep Foot Roller	12	8	
Impervious	95	+3 to -1	" " "	8	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-No. 4 FRACTION DRY DENSITY (PCF) (COL 18)	-No. 4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX. DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	MAX. DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-289	9-25-73	R.V.	17+30	25' Rt.	554	12	Main Emb.	Area X	Br. S.C. (E)								105.7	13.3				114.7	14.9	-1.6	92.3	
R-290	9-27-73		22+25	25' Lt.	557				(E) Br. Cl.		* —	* —	13.3	12			107.8	15.0				112.6	16.7	-1.7	95.7	* 200 not run on test
R-291	"		22+50	40' Lt.	556				Br. S.C. (E)								99.8	18.8				107.3	20.7	-1.9	96.1	
R-292	10-2-73		17+25	20' Lt.	557				Br. S.C. (E)								110.7	14.1				107.6	14.0	+0.1	102.8	
R-293	"		17+00	35' Lt.	558				R. SCL. (E)								99.9	22.8				104.5	24.2	-1.4	95.6	
R-294	10-4-73		21+50	25' Lt.	558				B. S.C. (E)								102.3	17.7				107.4	19.5	-1.8	95.3	
R-295	10-9-73		22+50	30' Lt.	558				Br. S.L. (E)		75.2	49.7	* —	* —			107.1	16.6				112.7	16.5	-0.1	95.1	LL not run
R-296	"		22+50	20' Rt.	558				Br. Cl. (E)								100.7	20.3				106.2	19.6	+1.1	94.5	
T-125	9-21-73	R.V.	16+25	℄	560	12	Main Emb.	Area X	Rdd. N		26.0	80.6	13.6	11.2			100.6	25.7				95.9	25.6	+0.1	104.8	
T-126	9-25-73		17+30	℄	554				Rd. CL (E)								101.8	19.0				104.2	20.1	-1.1	97.7	
T-127	10-4-73		21+50	5' Lt.	558				Br. CL (E)								106.9	16.0				112.2	16.5	-0.5	95.2	
T-128	10-12-73		14+40	℄	559				Rd. C.L. (E)								110.6	15.7				114.7	14.9	+0.8	96.5	
T-129	"		24+50	℄	560				Light Gr. (E)								114.8	11.1				112.5	16.7	+0.6	102.1	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC.
(1) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT).
COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____.
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8 E.G., AREA C, SPILLWAY EXCAVATION, ETC.
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED NOTE BY LETTER (E).
COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S.

COL 20 STANDARD METHOD: (A) 4-IN. DIAM MOLD, (B) 6-IN. DIAM MOLD AS OUTLINED IN MANUAL EM 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.
COL 23 24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G., 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: W.H. McGeorge Jr.

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER: Saline / STATE: Arkansas / TOWN: Dierks	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam		DACW-34-C-71-0159	Amis Const. Co.	28 Nov. 1973	30 / SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8-9 ____ 10-11 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (2)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Random	95	±3	S.F.R.	12	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-3/4 FRACTION DRY DENSITY (PCF) (COL 18)	-3/4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX. DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	MAX. DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-297	11-22-73	W.V.	15+50	10' Lt.	559	12	Random	Area X	Br. CL E.								112.4	15.4				114.4	15.5	-0.1	98.3	
R-298	"		15+50	25' Lt.	559																					Too Rocky for Density
R-299	11-25-73		16+00	30' Lt.	558				Gr. Sandy C(E)								104.1	13.8				102.9	12.0	-3.2	96.5	
R-300(c)	"		16+00	25' Lt.	558						M+ Min	M+ Min	M+ Min				101.5	12.5				103.8	24.1	-11.6	97.8	
R-301	11-29-73		13+50	20' Lt.	560				Br. S.C. (E)								98.7	11.6				103.5	15.7	-2.1	95.3	
R-302	"		13+50	35' Lt.	560																					Too Rocky for Density
R-303	11-30-73		15+25	20' Lt.	559				Br. SC (E)								108.2	18.3				109.5	18.4	-0.1	98.3	
R-304	12-7-73		20+00	25' Rt.	560				Br. S.C.		21.7	22.7	17	11.7			104.6	11.8				109.4	12.7	-0.9	95.4	Record Sample
R-305	12-9-73		17+15	35' Lt.	561				Br. CL		44.8		5	2.9			114.4	12.3				112.0	12.3	0	95.6	
R-306	"		17+85	25' Lt.	561				Br. S.C (E)								114.4	11.8				114.3	11.9	-0.1	99.8	
R-307	12-14-73		23+25	20' Lt.	564				Br. S.C (E)								104.4	15.3				110.1	15.8	-0.5	95.4	
R-308	"		24+00	15' Lt.	564																					Too Rocky for Density
R-309	12-15-73		14+00	20' Lt.	565																					Too Rocky for Density
R-310	"		13+50	10' Rt.	565				Gr. GC (E)+								92.1	12.5				104.0	11.8	-2.9	88.6	LL & PI not Complete
R-311	12-18-73		19+00	25' Rt.	565				Br. S.C (E)								111.4	11.5				112.4	11.0	+0.5	99.1	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT) OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ____ ( )

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC.

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COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

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COL 21-22 1- OR 3-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G., 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION, VISUAL COMPARISON, ETC.

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24.

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U.S. ARMY ENGINEER ____ CORPS OF ENGINEERS

PREPARED BY: W.H. McGessing Jr.

SUBMITTED BY: ____ RESIDENT ENGINEER

ENG FORM 4080 JUN 67

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

MAIN FORM — RCS: ENGCW-E-11(R1)

PROJECT: Dierks Dam

RIVER: Saline
STATE: Arkansas
TOWN: Dierks

CONTRACT NO.: DACW-56-C-11-0157

CONTRACTOR: Amis Const. Co.

DATE OF REPORT: 20 Nov, 1973

REPORT NO.: 30

SHEET 2 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ______ 3-4 ______ 5- ______ 6-7 ______ 8-9 ______ 10-13 ______

EMBANKMENT ZONE: Impervious

SPECIFIED % COMP: 95

SPECIFIED W % LIMITS: +3 to -1

COMPACTION EQUIPMENT (2): S.F.R.

LOOSE LIFT THICKNESS (IN.): 8

NUMBER OF PASSES: 8

CONTACT PRESSURE (PSI):

TEST IDENTIFICATION / CLASSIFICATION (GRADATION, ATTERBERG LIMITS) / IN-PLACE DATA (TOTAL SAMPLE, -#4 FRACTION) / LABORATORY TEST DATA (STANDARD METHOD) / FIELD AND LABORATORY CORRELATION

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 13)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	FRACTION DRY DENSITY (PCF) (COL 18)	FRACTION WATER CONTENT (%) (COL 19)	TEST (COL 20)	MAX DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	MAX. DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
T-180C	10-23-73	WV	24+25	℄	560	12	Main Emb	Borrow X	Red+Gr Cl.(E)								106.0	21.7				104.3	22.2	-0.5	97.8	
T-181	"		14+00	5' Rt.	560				Br. S.C. (E)								107.2	18.0				103.7	19.3	-1.3	103.3	
T-182	10-30-73		16+25	℄	560				Br. Cl. (E)								114.7	14.9				114.2	15.1	-0.2	100.5	
T-183	11-7-73		20+00	℄	560				Tan S.C.		91.0	45.0	14.0	12.6			116.4	15.0				118.9	13.0	+2.0	98.0	Record Sample.
T-184	11-9-73		17+00	5' Lt.	562				Br Cl. (E)								116.0	14.5				116.5	14.5	0	99.6	
T-185(D)	11-14-73		23+50	5' Lt.	564				Br. Sc. (E)		(Test not completed)						116.9	14.5				117.3	14.3	+0.2	99.6	
T-186	11-15-73		13+50	℄	565				Red S.C. (E)								117.3	13.1				116.6	12.7	+0.4	98.1	
T-187	11-16-73		13+00	℄	565				Red S.C. (E)								120.9	12.9				118.6	13.1	-0.2	101.1	

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 — CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ______ ( ).

COL 5 — RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.

COL 7 — DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL 9 — E.G.: AREA C, SPILLWAY EXCAVATION, ETC.

COL 10 — ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)

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COL 25 — COL 17 OR COL 19 MINUS COL 22 OR COL 24.

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U. S. ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: W.D.L. McGarvin Jr.

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN ...)

RCS: ENGCW-E-11(R1)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:
Dierks Dam	RIVER: Saline STATE: Arkansas TOWN: Dierks	DACW-57-C-11-0159	Amis Const. Co.	20 Dec 1973	31 SHEET 1 OF 2

SPACE RESERVED FOR PUNCH CARD OPERATOR	EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
1-2 / 3-4 / 5- / 6-7 / 8-9 / 10-13	Random	95	± 3	S.F.R.	12	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	GRADATION: MAX PART. SIZE (IN.) (COL 11)	GRADATION: % PASSING #4 SIEVE (COL 12)	GRADATION: % PASSING #200 SIEVE (COL 13)	ATTERBERG LIMITS: LL (COL 14)	ATTERBERG LIMITS: PI (NOT PL) (COL 15)	IN-PLACE TOTAL SAMPLE: DRY DENSITY (PCF) (COL 16)	IN-PLACE TOTAL SAMPLE: WATER CONTENT (%) (COL 17)	IN-PLACE - No. 4 FRACTION: DRY DENSITY (PCF) (COL 18)	IN-PLACE - No. 4 FRACTION: WATER CONTENT (%) (COL 19)	LAB STANDARD METHOD: TEST (COL 20)	LAB STANDARD METHOD: MAX. DRY DENSITY (PCF) (COL 21)	LAB STANDARD METHOD: OPT WATER CONTENT (%) (COL 22)	LAB: MAX. DRY DENSITY (PCF) (COL 23)	LAB: OPT WATER CONTENT (%) (COL 24)	FIELD AND LAB CORRELATION: W % + OR - (COL 25)	FIELD AND LAB CORRELATION: PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
R-312	11-21-73	NV	22+00	35' Rt.	567	12	Main Emb.	Area E	B..S.C (E) or S.L.U Rock								115.0	13.7				115.2	15.4	-1.7	99.8	
R-313	11-25-73		14+25	20' Lt.	568			"									103.2	20.4				106.3	19.9	-0.5	97.1	Too Rocky for density Transist. im Mat.
R-314	"		14+80	25' Rt.	568			Spillway																	"	"
R-315	12-6-73		22+00	20' Lt.	571			"																	"	"
R-316	"		22+00	20' Rt.	571			"																	"	"
R-317	"		13+00	25' Lt.	569			"																	"	"
R-318	12-11-73		23+10	15' Rt.	572			"																	"	"
R-319	"		23+10	15' Lt.	572			"																	"	"
R-320	"		14+50	20' Lt.	578			"																		
R-321	12-12-73		16+50	20' Lt.	570			"																		
R-322	"		16+50	20' Rt.	569			[illegible]	Shale + Rock								102.9	17.1				106.7	14.4	-2.7	96.4	Too Rocky for density Shale, Rock & Soil
R-323	12-14-73		15+00	30' Lt.	573			"																	"	"
R-324	"		15+25	20' Rt.	573			"																	"	"
R-325	"		21+00	20' Lt.	575			"																	"	"
R-326	12-17-73		17+90	20' Lt.	575			"																	"	"
R-327	"		11+70	20' Rt.	575			"																		

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
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COL 3 — CYLINDER (CYL), CHUNK (CH), SAND-VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ______ ( ).

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COL 7 — DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST

COL 9 — E.G. AREA C, SPILLWAY EXCAVATION, ETC

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U S ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: W.H. McGerring, Jr.

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(a) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

RCS: ENGCW-E-11(R1)

PROJECT:	RIVER / STATE / TOWN:	CONTRACT NO.:	CONTRACTOR:	DATE OF REPORT:	REPORT NO.:	SHEET
Dierks Dam	RIVER: Saline STATE: Arkansas TOWN: Dierks,	DACW-56-C-71-0159	Amis Const. Co	20 Dec 1973	31	2 of 2

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W% LIMITS	COMPACTION EQUIPMENT (b)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3 to -1	S.F.R	8	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 FRACTION WATER CONTENT (%) (COL 19)	STANDARD METHOD TEST (COL 20)	STANDARD METHOD MAX. DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	MAX. DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-188	11-21-73	WV	22+00	5' Rt.	567	12	Main Emb	Area X	Rd-C (E)								119.2	14.1				118.8	14.0	+0.1	100.4	
I-189	11-28-73		14+75	5' Rt.	566				Rd-C (E)								120.3	14.2				118.9	13.4	+0.8	101.2	
I-190	12-8-73		15+00	℄	568				Rd-C		75.3	46.3	25.6	12.6			106.9	19.6				110.8	17.6	+2.0	96.5	
I-191	"		20+50	5' Lt.	572				Ld CH (E)								112.2	17.7				110.8	16.9	+0.4	101.3	Std Dry wt 113.0 opt H2O 15.4
I-192	12-15-73		11+50	℄	568				Rd CL (E)								123.5	11.1				124.9	9.7	+1.4	98.8	
I-193	"		15+00	5' Rt	574				Rd CL (E)								114.7	13.9				110.7	13.9	0	97.7	

NOTE: (a) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)
COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV) NUCLEAR METHOD (NM) OTHER ____ ( )
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)
COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.
COL 21-22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS
COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD; RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.
COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24
COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.
COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U. S. ARMY ENGINEER ____
CORPS OF ENGINEERS

PREPARED BY: W.H. McFerrin, Jr.

SUBMITTED BY: ____
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT:	RIVER / STATE / TOWN	CONTRACT NO.:	CONTRACTOR	DATE OF REPORT:	REPORT NO.:
Dierks Dam	RIVER: Saline STATE: Arkansas TOWN: Dierks	DACW 56-C-71-C157	Amis Const. Co.	18 Jan 1974	32 SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5- ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE	SPECIFIED % COMP	SPECIFIED W % LIMITS	COMPACTION EQUIPMENT (1)	LOOSE LIFT THICKNESS (IN.)	NUMBER OF PASSES	CONTACT PRESSURE (PSI)
Impervious	95	+3 -1	SFR	8	8	
Random	95	±3	SFR	12	8	

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX. PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	TOTAL SAMPLE DRY DENSITY (PCF) (COL 16)	TOTAL SAMPLE WATER CONTENT (%) (COL 17)	-#4 FRACTION DRY DENSITY (PCF) (COL 18)	-#4 FRACTION WATER CONTENT (%) (COL 19)	TEST (COL 20)	STANDARD METHOD MAX. DRY DENSITY (PCF) (COL 21)	STANDARD METHOD OPT WATER CONTENT (%) (COL 22)	MAX DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR - (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-194	1-7-74	UAV	12+50	℄	575	12	Main	Area X	Rd CL (E)								112.5	11.2		-	.	115.2	13.5	-1.6	96.4	
I-195	"		18+00	℄	576		"		Red CL		88.5	54.4	31.5	14.3			112.5	12.7				112.2	14.0	-1.3	100.2	
I-196	"		22+00	℄	578		"		Red Ca (E)								119.3	11.3				114.6	15.1	-1.2	104.1	
																								[illegible]	[illegible]	[illegible]
R-328	1-7-74		13+00	20' Lt.	575		"																			
R-329	"		13+00	20' Rt.	574		"																		"	"
R-330	"		18+50	25' Rt.	575		"																		"	"

NOTE: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(b) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT).

COL 3 CYLINDER (CYL), CHUNK (CK), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM), OTHER ______ ( ).

COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.

COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.

COL 9 E.G.: AREA C, SPILLWAY EXCAVATION, ETC

COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)

COL 11-13 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

COL 20 STANDARD METHOD: (A) 4-IN.-DIAM MOLD, (B) 6-IN.-DIAM MOLD AS OUTLINED IN MANUAL 1110-2-1906. IF MATERIAL WITH MAX PARTICLE SIZE GREATER THAN 3/4 IN. OR OTHER EFFORT IS USED IN THE LAB COMPACTION TEST, NOTE AS NS UNDER COL 20 AND REPORT DETAILS OF PROCEDURE.

COL 21 22 1- OR 2-POINT COMPACTION DATA ON FIELD SAMPLES CAN BE RECORDED IN COL 21 AND 22, MAKING APPROPRIATE CHANGES IN COLUMN HEADINGS.

COL 23-24 FOR USE WHEN MAX DENSITY AND OPTIMUM WATER CONTENT ESTIMATED. STATE HOW ESTIMATED BY FILLING IN BLANK, E.G. 1-POINT STANDARD METHOD, RAPID COMPACTION CONTROL; LIQUID LIMIT CORRELATION; VISUAL COMPARISON, ETC.

COL 25 COL 17 OR COL 19 MINUS COL 22 OR COL 24

COL 26 INDICATE DERIVATION, E.G. FOR COL 16 ÷ COL 21 OR COL 23, INDICATE BY A OR B, RESPECTIVELY. FOR COL 18 ÷ COL 21 OR COL 23, INDICATE BY C OR D, RESPECTIVELY.

COL 27 IF TEST RESULTS DO NOT MEET SPECIFICATIONS, DENOTE BY LETTER (U) AND NOTE REMEDIAL TREATMENT IN FOOTNOTE. WHEN UNSATISFACTORY AREA IS REWORKED AND RETESTED, DENOTE BY (R).

U S ARMY ENGINEER ______

CORPS OF ENGINEERS

PREPARED BY: W.R. McL[illegible]

SUBMITTED BY: ______

RESIDENT ENGINEER

ENG FORM 4080
JUN 67

(MAIN FORM)

RCS: ENGCW-E-11(R1)

(1) Monthly SUMMARY OF FIELD COMPACTION CONTROL OF IMPERVIOUS OR SEMIPERVIOUS SOILS FOR CIVIL WORKS PROJECTS

PROJECT: Dierk's Dam

RIVER: Saline
STATE: Arkansas
TOWN: [illegible]

CONTRACT NO.: DACW 38-C-71-C159

CONTRACTOR: Amis Const Co

DATE OF REPORT: 15 Feb 1974

REPORT NO.: 33

SHEET 1 OF 1

SPACE RESERVED FOR PUNCH CARD OPERATOR

1-2 ____ 3-4 ____ 5 ____ 6-7 ____ 8-9 ____ 10-13 ____

EMBANKMENT ZONE: Impervious

SPECIFIED % COMP: [illegible] W C LIMITS: +3 -1

COMPACTION EQUIPMENT (1): SFR

LOOSE LIFT THICKNESS (IN.): 8

NUMBER OF PASSES: 8

CONTACT PRESSURE (PSI):

TEST NO. (COL 1)	DATE MADE (COL 2)	TYPE TEST (COL 3)	STATION (COL 4)	OFFSET (FT) (COL 5)	ELEVATION (FT) (COL 6)	DEPTH (IN.) (COL 7)	EMBANKMENT ZONE (COL 8)	BORROW SOURCE (COL 9)	CLASS WORD OR LETTER SYMBOL (COL 10)	MAX PART SIZE (IN.) (COL 11)	% PASSING #4 SIEVE (COL 12)	% PASSING #200 SIEVE (COL 13)	LL (COL 14)	PI (NOT PL) (COL 15)	Total Sample DRY DENSITY (PCF) (COL 16)	Total Sample WATER CONTENT (%) (COL 17)	-#4 Sieve Fraction DRY DENSITY (PCF) (COL 18)	-#4 Sieve Fraction WATER CONTENT (%) (COL 19)	TEST (COL 20)	MAX. DRY DENSITY (PCF) (COL 21)	OPT WATER CONTENT (%) (COL 22)	MAX. DRY DENSITY (PCF) (COL 23)	OPT WATER CONTENT (%) (COL 24)	W % + OR − (COL 25)	PERCENT COMPACTION (COL 26)	COMMENTS ON TESTS (COL 27)
I-197	1-25-74	W.V.	22+00	℄	581	12	Main	X	Red CL (E)								113.6	13.1				112.2	12.4	+0.7	101.3	
I-198	"	"	15+00	℄	580				Red CL (E)								114.7	12.9				111.8	12.7	+0.2	102.6	
I-199	1-31-74		24+00	℄	585				Red CL (E)								110.8	11.1				114.0	11.2	-0.1	97.2	
I-200	"		15+00	℄	584				Red CL (E)								110.0	13.2				113.8	11.2	+2.1	96.7	
I-201	2-6-74		14+50	℄	587				Red CL (E)								111.8	14.3				117.0	12.7	+1.6	95.5	
I-202	"		21+00	℄	587				Red CL (E)								112.9	14.9				117.0	14.1	+0.8	96.5	

NOTES: (1) FILL IN APPROPRIATE WORD: DAILY, WEEKLY, MONTHLY, OR PERIODIC
(2) ENTER TYPE OF EQUIPMENT USED, E.G.: SHEEPSFOOT ROLLER (SFR), PNEUMATIC ROLLER (PR), VIBRATORY ROLLER (VR), PNEUMATIC HAND TAMPER (PHT), OR VIBRATORY TAMPER (VT)

COL 3 CYLINDER (CYL), CHUNK (CH), SAND VOLUME (SV), WATER VOLUME (WV), NUCLEAR METHOD (NM) OTHER ______ ( ).
COL 5 RECORD OFFSET BY DISTANCE UPSTREAM OR DOWNSTREAM OF CENTERLINE OF DAM OR RIGHT OR LEFT OF AXIS.
COL 7 DEPTH FROM FILL SURFACE TO TOP OF DENSITY TEST.
COL 8 E.G.: AREA C, SPILLWAY EXCAVATION, ETC
COL 10 ENTER SOIL COLOR BEFORE CLASS. WHEN CLASS ESTIMATED, NOTE BY LETTER (E)
COL 11-15 WHEN BOTH GRADATION AND WATER CONTENT CONTROL OF THE FILL MATERIAL IS A SPECIFICATION REQUIREMENT, USE THE SUPPLEMENTAL FORM ALONG WITH THIS FORM, USING THE SAME SHEET NUMBER FOR THE SUPPLEMENTAL SHEET FOLLOWED BY AN S

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U S ARMY ENGINEER ______
CORPS OF ENGINEERS

PREPARED BY: [signature] Jr.

SUBMITTED BY: ______
RESIDENT ENGINEER

ENG FORM 4080
JUN 67

APPENDIX G

SOIL TEST DATA SUMMARY

TEST DATA SUMMARY

SWDEL A: 9891-2

FEATURE: Jo Meters

Dierks Dam

Sheet 1 of 6

Boring No.	Sam No.	Depth or Elev of Sample	Laboratory Classification	Gravel %	Sand %	Fines %	D_{10}	LL	PL	Specific Gravity	Nat Water Cont %	Natural Dry Density	Compaction Data	Initial e	Dry Density	w_o %	S_o %	S_f %	Type Test	Specimen Size Inches	Test	σ_3	σ_1	c	φ	Remarks
TP-488																										
MC540		00-80	SM	3	71	26		NP	NP																	
				SAND, silty, yellowish brown																						
													Remolded to 95%	486	112.2	6.9	17.9	37	TC-R	14x30	1	1.55	6.46	—	—	
													maximum density at	481	112.5	7.0	18.1	39	"	"	2	3.00	9.91			
													optimum -3%	488	112.1	7.0	17.2	38	"	"	3	6.05	16.40			
													Remolded to 95%	480	112.7	9.5	17.2	53	TC-R	14x30	1	1.55	11.23	—	—	
													maximum density at	476	112.9	9.4	17.4	53	"	"	2	2.90	19.70			
													optimum water content	402	112.5	9.6	17.2	53	"	"	3	6.05	21.24			
													Remolded to 95%	506	110.7	14.4	16.7	76	TC-R	14x30	1	1.60	12.32	—	—	
													maximum density at	509	110.4	14.9	17.1	78	"	"	2	3.00	22.29			
													optimum +4%	509	110.4	13.9	16.8	73	"	"	3	6.10	30.45			

ENG FORM 2086 1 JAN 58 (PREVIOUS EDITIONS MAY BE USED) (TRANSLUCENT)

TC – Triaxial Compression; UC – Unconfined Compression; DS – Direct Shear; UU – Unconsolidated Undrained; CD – Consolidated Drained; R – Consolidated Undrained; *Values of Pressure

T/SO PT

TEST DATA SUMMARY

FEATURE FOUNDATION EXCAVATION

[illegible] DAM
FOUNDATION MATERIALS
UNDISTURBED TESTS

Sheet 2 of 6
DM 10

Boring No.	Sample No.	Depth or Elev. of Sample	Laboratory Classification	Mech. Analysis: Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits: LL	PL	Specific Gravity	Water Content %	Natural Dry Density lb/cu ft	Compaction: Opt Water %	Maximum Dry Density lb/cu ft	Shear: Initial e	Dry Density lb/cu ft	w_o %	w_f %	S %	Type Test	Specimen Size inches	Test	σ_3 T/sq ft	σ_1 T/sq ft	c T/sq ft	ϕ degrees	Permeability: k	e	Consolidation: P_o T/sq ft	P_c T/sq ft	C_c	e_o	Remarks
6DRC-10																																	
	2983	1.0-2.0	CL					32	12		13.3	112																					
	2984	0.8-1.8	CL								15.7	107																					
	2984-A	1.8-2.8	CL					27	11		20.3	102																					
	2985	2.8-4.4	CL								18.4	108																					
6DRC-11																																	
	2900	3.0-5.0	SM								10.3	104																					
	2901	5.0-7.0	SM					NP	NP		16.8	107				110.8	17.0		91	T-Q	1.4 x 3.0				0.4	8.1							
																109.0	17.4	16.0	88	T-R	1.4 x 3.0				0.5	20.2							
																108.5	15.9	14.6	80	DS-S	3 x 3 x .5				0.1	32.6							
	2902	7.0-9.0	CL								14.4	108																					
6DRC-17																																	
	3204	11.4-12.3	Sandstone								6.5	141				144	4.2			UC	6.0 x 7.8		0.0	31.4									
	3205	17.5-18.3	Graywacke								7.2	129																					
	3833	41.9-42.8	Sandstone								0.2	161				161	0.2			UC	6.0 x 9.9		0.0	905									
6DRC-31																																	
	2991	0.6-2.6	CL								20.9	103																					
6DRC-34																																	
	2768	0.4-1.5	SM								14.4	101																					
	2768-A	1.5-3.5	SM								15.6	105																					
	2769	3.5-5.5	SM								12.2	113																					
	2770	5.5-7.5	SM								15.5	108																					
	2771	7.5-9.5	SM								11.4	107																					

TC – Triaxial Compression
UC – Unconfined Compression
DS – Direct Shear
UU – Unconsolidated Undrained
CD – Consolidated Drained
CU – Consolidated Undrained
*Values at Pressure

TEST DATA SUMMARY

FEATURE FOUNDATION EXCAVATION

DIERKS DAM
FOUNDATION MATERIALS
UNDISTURBED TESTS

Sheet 3 of 6
DM 4 B

Boring No.	Sample No.	Depth or Elev. of Sample	Laboratory Classification	Mechanical Analysis Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits LL	PL	Specific Gravity	Nat. Water Cont. %	Natural Dry Density Lbs/Cu Ft	Compaction Data Opt. Water %	Maximum Dry Density Lbs/Cu Ft	Shear Data Initial e	Dry Density Lbs/Cu Ft	w_o %	w_f %	S %	Type Test	Specimen Size Inches	Test	σ_3 T/Sq Ft	σ_1 T/Sq Ft	c T/Sq Ft	ϕ Degrees	Permeability k	k	Consolidation Data p_o	p_c	C_c	c_v	Remarks
6C-35																																	
	3814	23.1-24.0	Sandstone								0.7	159				158	0.7			UC	5.7 x 10.3		0.0	19.2									
	3815	29.5-30.5	Argillite								--	156																					
	3816	34.0-34.9	Sandstone								0.2	161				160	0.2			UC	6.0 x 10.3		0.0	353									
6C-37																																	
	3918	18.1-19.0	Sandstone								1.5	158				158	1.5			UC	6.2 x 10.3		0.0	158									
	3919	25.6-26.5	Sandstone								--	160				160	--			UC	6.0 x 8.8		0.0	919									
6C-8A																																	
	5065	6.7-7.7	Sandstone								4.8	133																					
	5066	8.3-9.1	CH								17.5	112																					
	5067	10.2-11.0	Sandstone								4.4	140																					
6C-13A																																	
	5068	13.3-13.9	CL					39	20		12.4	119																					
	5069	16.6-17.4	Shale								10.2	132				133	9.9			UC	6.0 x 5.9		0.0	23.2									
	5070	18.3-19.0	Shale					36	20		9.2	131				136.1	8.5	9.6	91	DS	3 x 3 x 0.5				0.3	34.3							
	5071	22.2-23.1	Sandstone								1.4	155																					
	5072	24.9-25.8	Shale								7.1	137																					
	5073	26.5-27.4	Sandstone								5.9	141																					
	5074	28.7-29.6	Shale								6.[illegible]	140																					
6C-32A																																	
	5075	2.5-3.5	Weathered Shale (CH)					54	24		14.0	107				104.7	[illegible]	27.9	[illegible]	DS	[illegible] x [illegible] x 0.5				0.2	20.0							
	5076	4.5-5.2	Weathered Shale (CL)					48	25		17.1	99																					
1C-190	11 767	70	Shale								4.4	150												[illegible]									

ENG FORM 1 MAR 66 2086 (PREVIOUS EDITIONS MAY BE USED) (TRANSLUCENT)

TC – Triaxial Compression DS – Direct Shear CD – Consolidated Drained *Values at Pressure T/SQ FT
UC – Unconfined Compression UU – Unconsolidated Undrained CU – Consolidated Undrained

TEST DATA SUMMARY

FEATURE FOUNDATION EXCAVATION

Boring No.	Lab No.	Depth or Elev. of Sample	Laboratory Classification	Gravel %	Sand %	Fines %	D_{10}	LL	PL	Specific Gravity G	Nat. Water Cont. %	Natural Dry Density	Opt. Water %	Maximum Dry Density	Initial e	Dry Density	w_o %	w_f %	S_o %	Type Test	Approx Condition	Test	σ_3	σ_1	c	ϕ	k	e	P_o	P_c	C_c		Remarks
SDC-165								17	13	2.68			11.?	120.?																			FOUNDATION EXCAVATION
	508-C	2.4-11.1	?L	0	49	51										115.1	11.2		??		95% ~ Cpt				0.?	25.2							
																115.1	13.9		92		95% ~ +3.0				0.3	14.5							
																114.7	11.1		65	-	95% ~ Cpt				0.2	11.0							
																114.7	14.1		8?	-	95% ~ +3.0				0.3	16.9							
								31	12	2.?8			14.4	113.8																		11	
104-2C-169	M-17 973	1.0-3.?	SC	14	39	47										113.0	14.7		??		100% ~ Cpt				1.2	14.1							
																107.9	17.6		??	-	95% ~ +3.0				0.4	7.0							
																107.6	14.8		72		95% ~ Cpt				0.7	16.0							
																107.5	11.8		?7		95% -3.0				1.4	22.5							
																113.2	15.0		?4	-	100% Cpt				0.7	14.5							
																107.5	17.9		?7	-	95% +3.0				0.6	15.5							
																107.3	14.9		72	-	95% Cpt				0.4	10.7							
																108.2	11.9		?9	?	95% -3.0				0.3	9.5							
																107.7	17.8		?6	-	95% +3.0				0.?	33.0							
	M-17							29	12	2.69																							
	974	3.3-6.0	GC-GP	65	23	12		39	?	2.?8	Ga	113.6	Max.																				
	975	6.0-11.2	GC	73	14	13				?.69	Ca	98.1	Min.																				
	976	11.2-16.7	GP-GP	70	20	10		74	11	2.58	Ga	120.9	Max.																				
										2.69	Ga	96.9	Min.																				
																																1	
TP-486	M-18 545	1.7-4.8	SC	32	46	25		30	13																								
TP-487	M-16	0.0-3.0																															
	546	0.0-3.0	GM-GC	66	20	14		15	11																								
	547	3.0-5.0	GC	43	38	19		27	12																								
TP-488	M-18												10.1	117.7	.418	117.6	10.1		65		100% ~ Opt				0.3	36.3							
	548	0.0-8.0	SM	4	71	25		NP	NP	2.67					.491	111.8	10.2		55	1	95% ~ Cpt				0.1	34.2						7	
															.492	111.7	10.3		55	-	95% ~ Cpt				0.1	25.3							
	549	8.0-12.0	SM	3	73	24		NP	NP																								
	550	12.0-16.0	SP-SC	43	45	12		18	11																								

TC – Triaxial Compression UC – Unconfined Compression DS – Direct Shear UU – Unconsolidated Undrained CD – Consolidated Drained CU – Consolidated Undrained *Values at ? drum ✓ T/SQ FT

ENG FORM 2086 (PREVIOUS EDITIONS MAY BE USED) (TRANSLUCENT)

TEST DATA SUMMARY

FEATURE FOUNDATION EXCAVATION

DIERKS DAM
COMPACTED SOILS

Sheet 5 of 8
DM No. 8

Boring No.	Samp. No.	Depth or Elev of Sample	Laboratory Classification	Mechanical Analysis: Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits: LL	PL	Specific Gravity	Nat Water Cont %	Natural Dry Density lb/cu ft	Compaction Data: Opt Water %	Maximum Dry Density lb/cu ft	Shear Data: Initial e	Dry Density lb/cu ft	w_o %	w_f %	S %	Type Test	Condition	Test	σ_3*	σ_1*	c T/sq ft	φ degrees	Permeability: k		Consolidation Data:		C_c		Remarks
TP-490	K-18																																
	562	6.8-9.4	SM	41	45	14		NP	NP																								FOUNDATION EXCAVATION
	563	13.1-15.5	SM	27	53	20		NP	NP																								
TP-491	K-18																																
	564	3.7-6.0	GC	62	22	16		24	11																								
	565	6.0-10.1	GC	67	19	14		26	12																								
TP-492	K-18																																
	566	8.1-9.4	GC	52	25	23		21	12																								
TP-493	K-18																																
	567	2.0-4.0	GC	60	23	17		25	13																								
	568	5.4-7.1	GP-GC	64	24	12		36	14																								
TP-491 & TP-493																																	
	K-18																																
	564C	2.0-10.1	*CL (GC)	0	49	51		25	12	2.69			12.4	118.4																			
															.421	118.2	12.5		80	Q	100% @ Opt				1.1	24.9							
															.490	112.7	9.7		53	[illegible]	95% @ -3.0				0.7	35.5							
															.493	112.6	12.5		69	Q	95% @ Opt				0.9	20.5							
															.488	112.9	15.5		86	[illegible]	95% @ +3.0				0.7	5.5							
															.421	118.2	12.8	15.5	81	R	100% @ Opt				0.7	17.6							
															.505	111.6	10.1	17.5	54	R	95% @ -3.0				0.3	9.5							
															.491	112.6	12.9	17.0	70	[illegible]	95% @ Opt				0.4	10.7							
															.497	112.2	15.9	14.9	87	R	95% @ +3.0				0.6	15.5							
															.494	112.4	12.7	13.7	69	[illegible]	95% @ Opt				0	34.0							

* K-18, 564C - a composite of minus No. 10, 10 fractions of PD samples K-18, 564, -18, 565 and -18, 567

TC = Triaxial Compression; UC = Unconfined Compression; DS = Direct Shear; UU = Unconsolidated Undrained; CD = Consolidated Drained; CU = Consolidated Undrained; *Values of Pressure T/SQ FT

TEST DATA SUMMARY

FEATURE IMPERVIOUS BORROW

DESIGN DM
COMPACTED SOILS

Sheet 6 of 6
DM #8

Boring No.	Sam. No.	Depth in Feet of Sample	Laboratory Classification	Mechanical Analysis: Gravel %	Sand %	Fines %	D_{10}	Atterberg Limits: LL	PL	Specific Gravity G	Nat Water Cont %	Natural Dry Density lb/cu ft	Compaction Data: Opt Water %	Maximum Dry Density lb/cu ft	Shear Data: Initial e	Dry Density lb/cu ft	w_o %	w_f %	S_o %	Type Test	Approx Condition	Test	σ_n T/sq ft	σ_1 T/sq ft	c T/sq ft	φ Degrees	Permeability: e	k	Consolidation Data: p_o T/sq ft	p_c T/sq ft	C_c	t_{50}	Remarks
8A-200	596	0.0-3.0	CL-ML	10	24	66		21	15	2.67			11.5	116.0		117.1	11.5		73	[illegible]	100% @ Opt				0.8	30.9							IMPERVIOUS
																110.6	14.6		77	[illegible]	95% @ +3.0				0.4	30.0							BORROW
																110.5	11.7		61	[illegible]	95% @ Opt				0.4	32.0							
																110.7	8.6		45	[illegible]	95% @ -3.0				0.4	33.2							
																116.2	11.0		73	[illegible]	100% @ Opt				2.2	38.6							
																111.2	15.1		80	[illegible]	95% @ +4.0				2.0	29.0							
																110.5	11.7		62	R	95% @ Opt				1.0	19.0							
																110.0	9.1		47	R	95% @ -2.0				1.1	14.0							
																110.7	14.7		77	[illegible]	95% @ +3.0				0.0	39.0							
	597	3.0-6.0	CL	4	18	78		25	14				11.0	116.8																			
8A-200	598	6.0-8.0	CL	0	19	81		28	13				13.8	115.1																			
8A-203	601	3.0-7.0	CL	0	14	86		29	13				13.8	115.7																			
8A-203	600	0.0-3.0	CL	0	14	86		30	14	2.69			12.8	116.3																			
																116.4	12.8		72	Q	100% @ Opt		—		1.2	25.2							
																110.3	15.0		71	Q	95% @ +3.0				0.7	12.5							
																110.0	12.0		66	Q	95% @ Opt				0.7	24.4							
																109.5	10.2		51	Q	95% @ -3.0				0.7	34.0							
																116.2	12.9		78	R	100% @ Opt				0.6	17.2							
																110.9	16.1		84	R	95% @ +3.0				0.7	14.0							
																109.0	13.0		68	R	95% @ Opt				0.3	11.5							
																110.2	10.2		52	R	95% @ -3.0				0.4	12.0							
																110.4	15.9		82	S	95% @ +3.0				0.1	34.6							
8A-207	503	0.0-5.0	CL	0	9	91		36	14				17.1	107.8																			
	504	5.0-6.5	CL	0	8	92		40	11	2.71			16.5	106.7																			
																107.2	16.5		77	Q	100% @ Opt		—		1.3	10.5							
																101.0	19.6		79	Q	95% @ +3.0				0.6	3.1							
																101.4	16.4		67	Q	95% @ Opt				0.6	22.0							
																101.7	13.6		55	Q	95% @ -3.0				1.0	24.0							
																106.7	16.7		77	R	100% @ Opt				0.1	17.2							
																101.0	20.1		80	R	95% @ +3.0				0.1	13.5							
																101.4	16.3		66	R	95% @ Opt				0.1	14.0							
																100.3	14.1		56	R	95% @ -2.0				0.0	16.5							
																101.2	19.9		80	S	95% @ +3.0				0.1	27.3							
8A-207	505	6.5-8.0	CL	0	10	90		41	14				17.1	107.9																			
8A-203	602	7.0-8.4	CL	0	11	89		43	15				18.6	105.7																			
8A-207	606	8.0-9.0	CL	0	10	90		47	14				19.6	103.5																			
8A-200	599	8.0-9.0	CL	0	5	95		47	19				23.2	98.7																			

ENG FORM 2086 (PREVIOUS EDITIONS MAY BE USED) (TRANSLUCENT)

TC – Triaxial Compression
UC – Unconfined Compression
DS – Direct Shear
UU – Unconsolidated Undrained
CD – Consolidated Drained
CU – Consolidated Undrained
*Values at Pressure T/SQ FT

APPENDIX H

PLATES

DIERKS DAM AND RESERVOIR
SALINE RIVER, ARKANSAS

EMBANKMENT CRITERIA AND PERFORMANCE REPORT

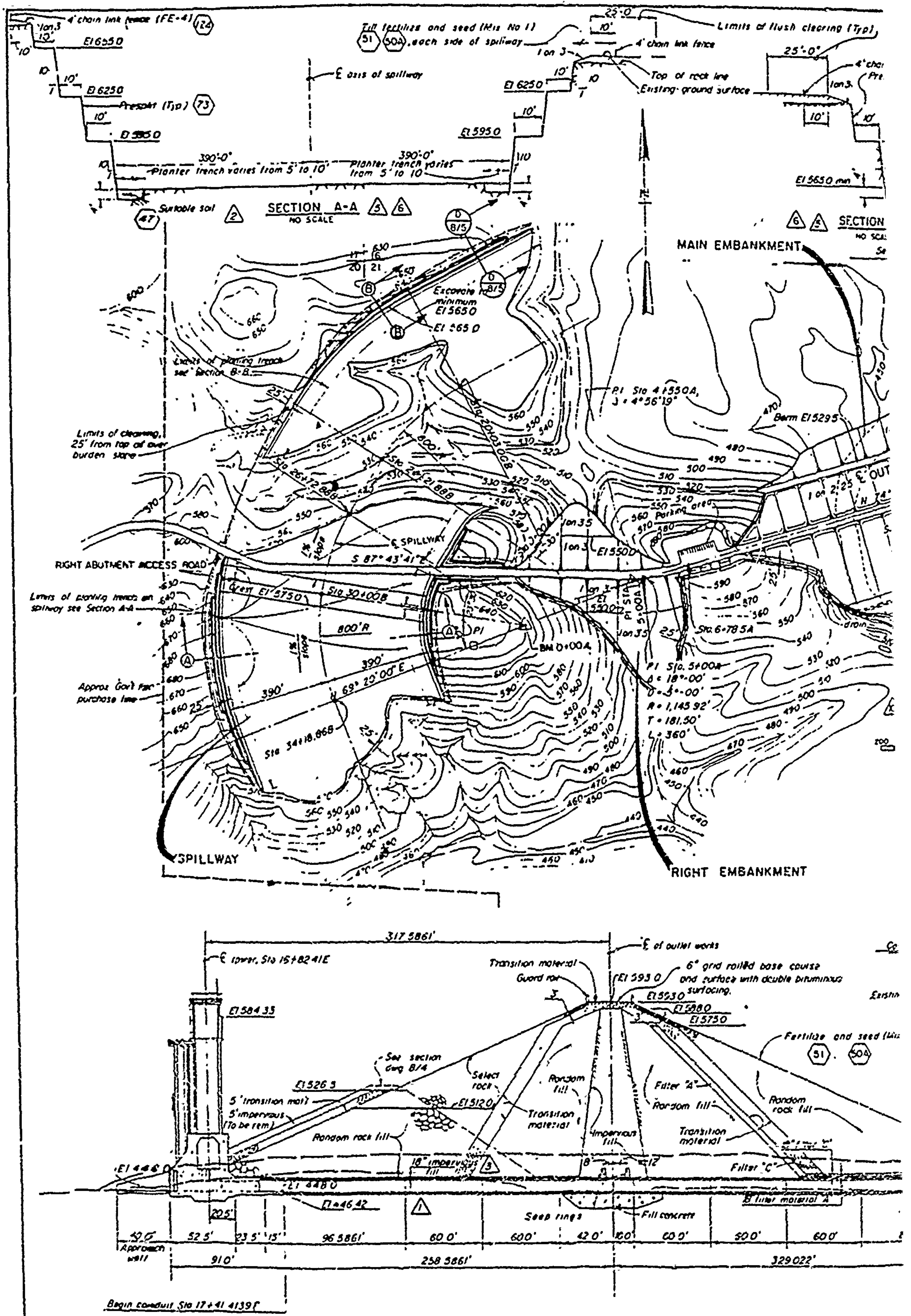
APPENDIX H - PLATES

Plate No.	Drawing No.	Title
1	1960-C3-2/1.10	General Plan and Sections
2	1960-C3-98/2	Foundation Exploration: Top of Rock Contours - Flood Plain
3	1960-C3-12/1.5	Embankment Plan and Profile
4	1960-C3-13/1.2	Engineering Measurement Devices: Embankment, Plan & Sections
5	1960-C3-98/3	Overburden Investigation: Sections AA, BB & CC - Borings & Test Pits
6	1960-C3-98/4	Overburden Investigation: Sections DD, EE & FF - Borings & Test Pits
7	1960-C3-98/5	Overburden Investigation: Sections GG & HH - Borings & Test Pits
8	1960-C3-98/6	Overburden Investigation: Sections II & JJ - Borings & Test Pits
9	1960-C3-98/7	Overburden Investigation: Sections LL, MM & KK - Borings & Test Pits
10	1960-C3-98/8.1	Overburden Investigation: Borrow Areas D & E - Plan & Logs
11	1960-C3-98/9A.1	Overburden Investigation: Borrow Area C - Plan & Logs
12	1960-C3-98/10	Foundation Exploration: General Geology & Plan of Exploration
13	1960-C3-98/11	Foundation Exploration: Geologic Sections A-A thru C-C
14	1960-C3-98/12	Foundation Exploration: Geologic Sections D-D thru F-F
15	1960-C3-98/13	Foundation Exploration: Geologic Sections G-G thru M-M
16	1960-C3-98/14	Foundation Exploration: Geologic Sections N-N thru P-P
17	1960-C3-98/15	Foundation Exploration: Geologic Sections & Rock Classification
18		Impervious Density Test Plot Profile Along Dam Axis
19		Density Test Plot Typical Embankment Sections "A" and "B"
20		Density Test Plot Typical Embankment Sections "C" and "D"
21		Density Test Plot Typical Embankment Section "E" and Right Embankment Section
22	1960-C3-8/5.4	Diversion & Excavation: Spillway Excavation - Plan, Profile & Section

APPENDIX H - PLATES
(continued)

Plate No.	Drawing No.	Title
23	1960-C3-13/2.5	Engineering Measurement Devices: Embankment Sections and Details
24	1960-C3-13/3	Engineering Measuring Devices: Outlet Works and Service Bridge - Plan, Sections and Details
25	1960-C3-22/22.1	Outlet Works - Conduit: Concrete & Reinforcing - Conduit and Seep Rings - Sections & Details I
26	1960-C3-22/24.1	Outlet Works - Stilling Basin: General Plan, Excavation & Details
27	1960-C3-8/4.5	Diversion & Excavation: First Stage & Second Stage Diversion - Plans & Sections
28	1960-C3-12/2.10	Embankment: Typical Sections
29	1960-DM8-12/5	Main Embankment: Typical Sections
30	1960-DM8-97/10	Right Embankment: Upstream Sta. 2+50 - Stability Analysis - Sudden Drawdown Cond.
31	1960-DM8-97/11	Right Embankment: Downstream Sta. 5+20 - Stability Analysis - Steady Seepage Cond.
32	1960-DM8-97/12	Right Embankment: Upstream Sta. 2+50 - Stability Analysis - Partial Pool Condition
33	1960-DM8-97/13	Right Embankment: Downstream Sta. 5+20 - Stability Analysis - End of Construction Cond.
34	1960-DM8-97/12	Embankment and Spillway Stability Analysis - Partial Pool
35	1960-DM8-97/15	Embankment and Spillway Stability Analysis - Sudden Drawdown
36	1960-DM8-97/16	Embankment and Spillway Stability Analysis - Steady Seepage
37	1960-DM8-97/17	Embankment and Spillway Stability Analysis - End of Construction
38		Embankment: Typical Section
39		Part I Foundation Emb. Grouting - Grouting Profile Sta. 0+00 to 7+00
40		Part I Foundation Emb. Grouting - Grouting Profile Sta. 7+00 to 14+00
41		Part I Foundation Emb. Grouting - Grouting Profile Sta. 14+00 to 21+00
42		Part I Foundation Emb. Grouting - Grouting Profile Sta. 21+00 to 27+00
43	1960-C3-13/4	Engineering Measurement Devices - Conduit - Sections and Detail
44	1960-C3-13/5	Engineering Measurement Devices - Embankment - Terminal Cabinet - Sections, Elevation and Details
45	1960-DM8-97/1	Materials Usage Chart - Contract
46	1960-DM8-97/18	Embankment and Spillway Materials Usage Chart - August 1972

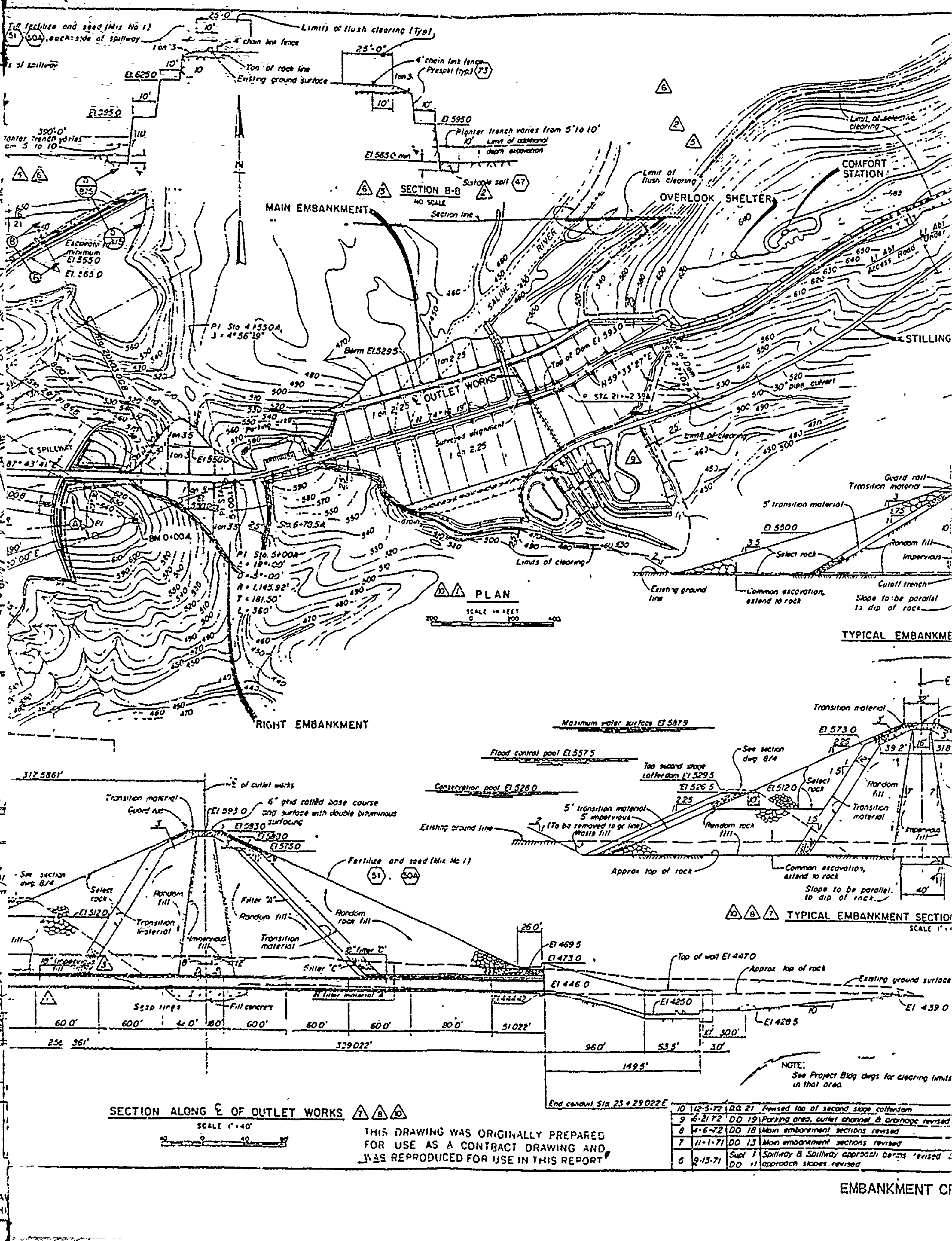
*U.S. GPO:1989-662-870



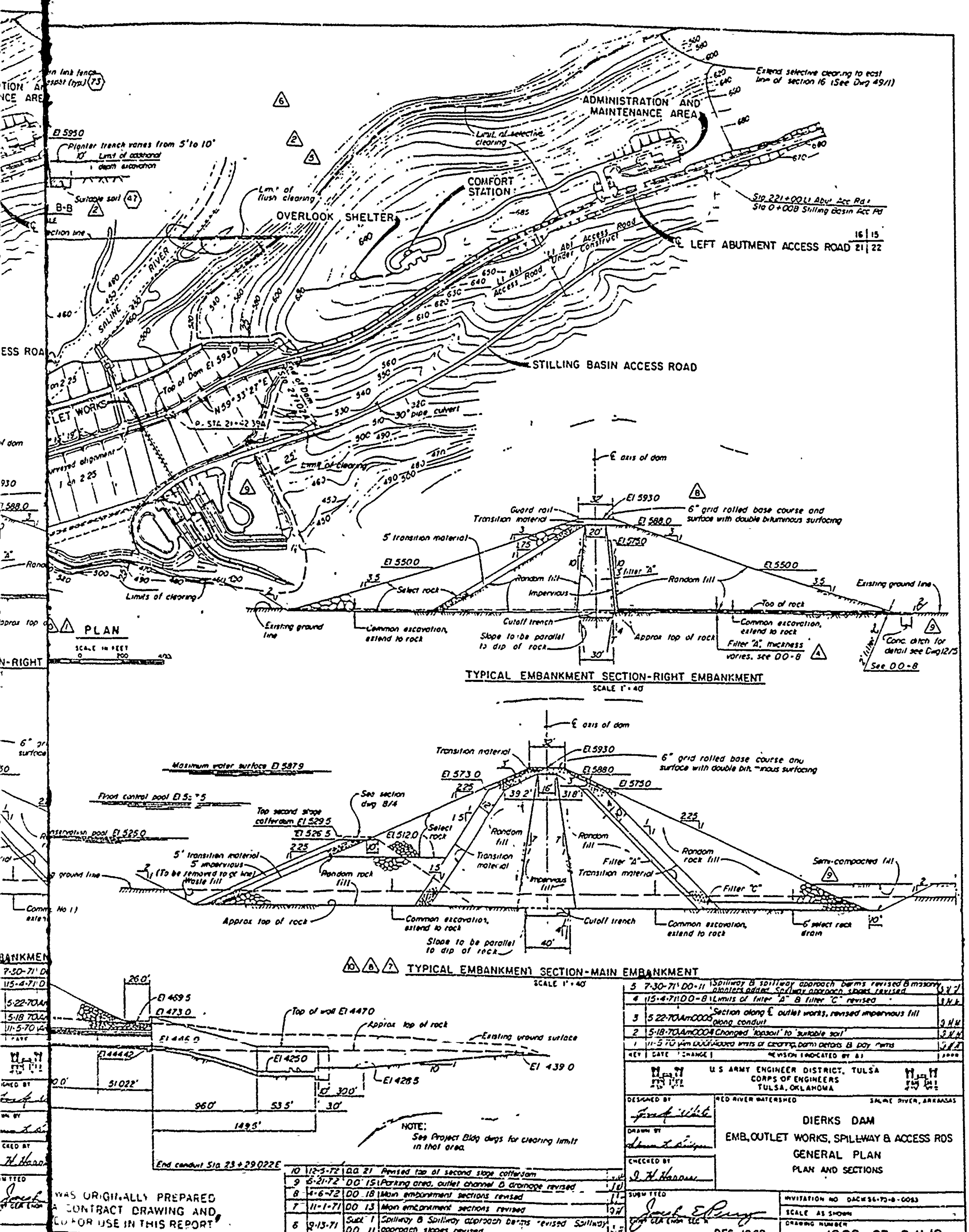
SECTION ALONG ℄ OF OUTLET WORKS

SCALE 1" = 50'

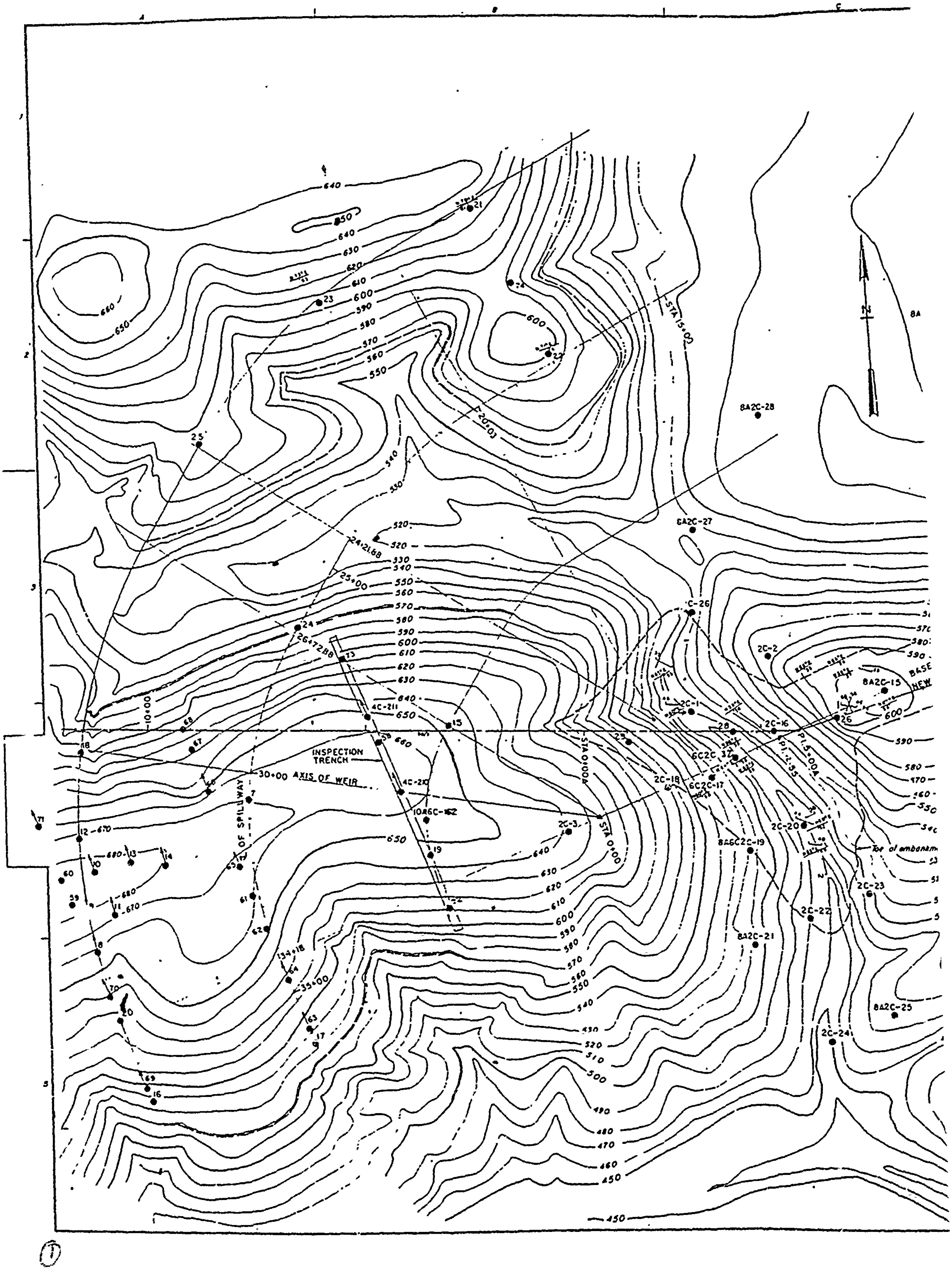
THIS DRAWING
FOR USE AS
WAS REPRODUC



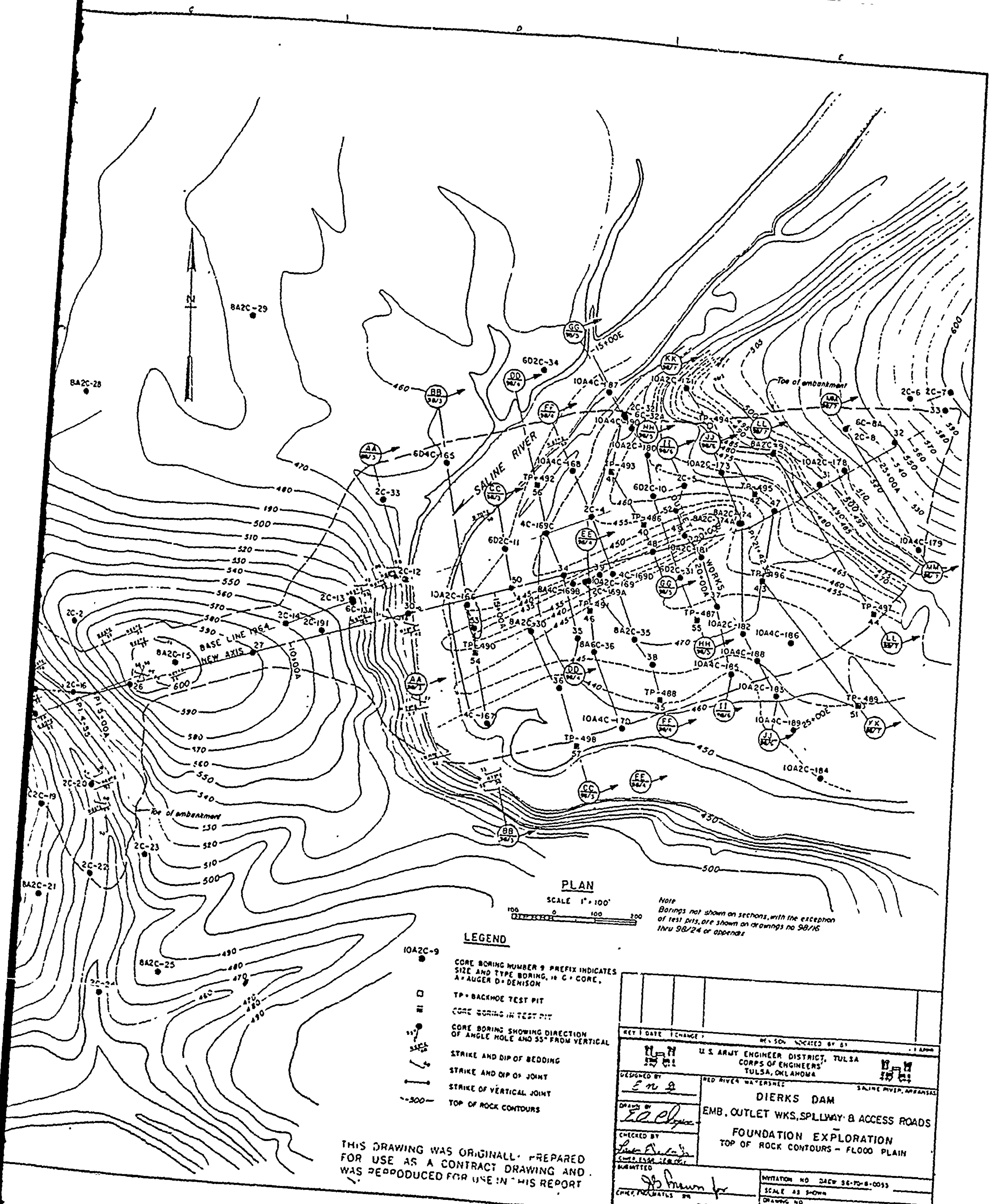
THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT



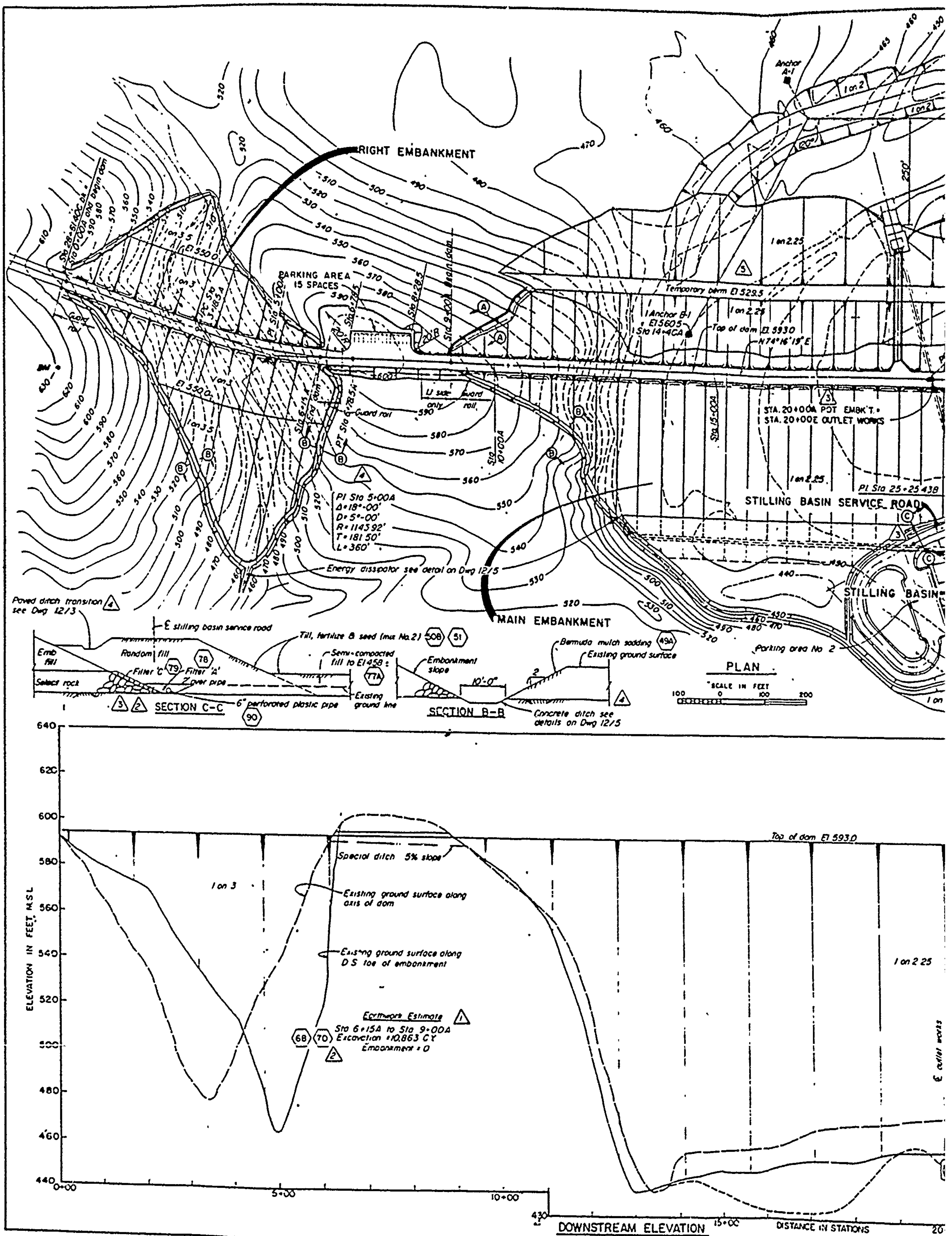
EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 1

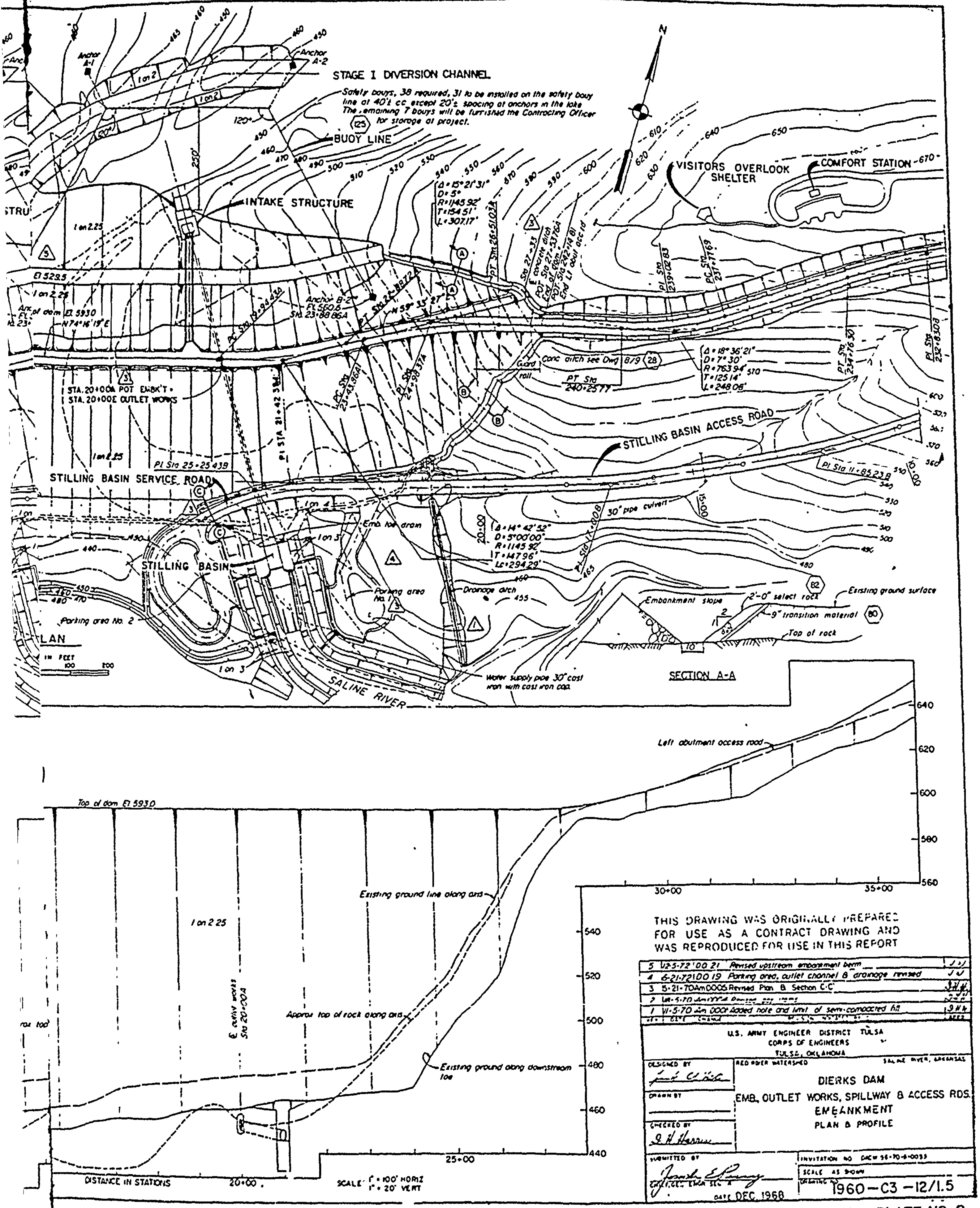


INSPECTION TRENCH
30+00 AXIS OF WEIR
OF SPILLWAY
STA 15+00
STA 0+00A
STA 0+00
24+21.68
25+00
26+72.88
35+00
34+18
8A2C-28
8A2C-27
2C-2
8A2C-15
2C-16
2C-18
6C2C-17
8A6C2C-19
2C-20
2C-22
2C-23
8A2C-21
8A2C-25
2C-24
2C-1
2C-3
4C-211
4C-210
10A6C-162
Toe of embankment
BASE
NEW
650
640
630
620
610
600
590
580
570
560
550
540
530
520
510
500
490
480
470
460
450

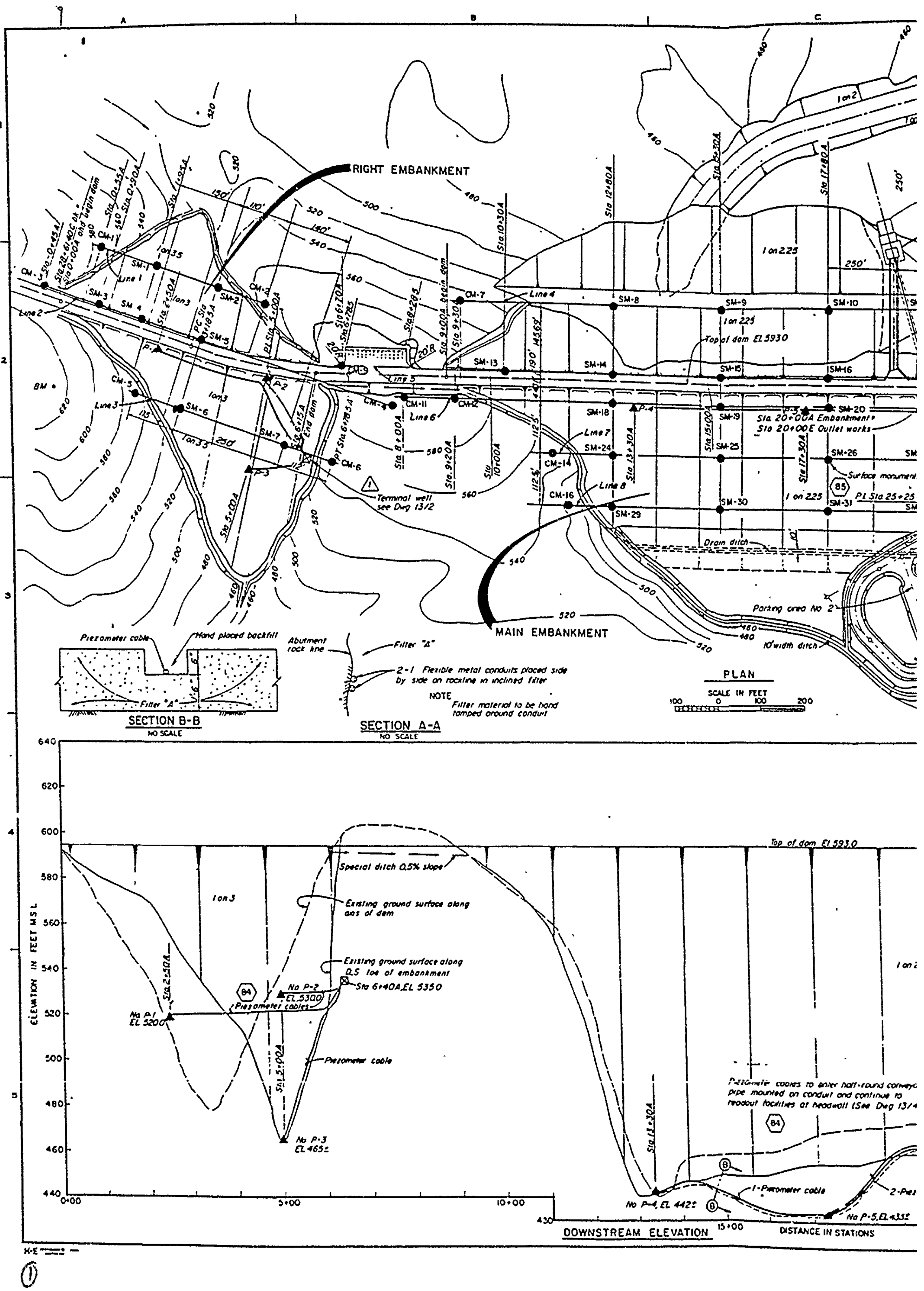


SALINE RIVER
BASE LINE 1964
NEW AXIS
Toe of embankment
OUTLET WORKS
PLAN
SCALE 1" = 100'
Note
Borings not shown on sections, with the exception of test pits, are shown on drawings no 98/16 thru 98/24 or appendix
LEGEND
10A2C-9
CORE BORING NUMBER 9 PREFIX INDICATES SIZE AND TYPE BORING, ie C = CORE, A = AUGER D = DENISON
TP = BACKHOE TEST PIT
CORE BORING IN TEST PIT
CORE BORING SHOWING DIRECTION OF ANGLE HOLE AND 55° FROM VERTICAL
STRIKE AND DIP OF BEDDING
STRIKE AND DIP OF JOINT
STRIKE OF VERTICAL JOINT
-500- TOP OF ROCK CONTOURS
THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA
RED RIVER WATERSHED
SALINE RIVER, ARKANSAS
DIERKS DAM
EMB, OUTLET WKS, SPILLWAY & ACCESS ROADS
FOUNDATION EXPLORATION
TOP OF ROCK CONTOURS - FLOOD PLAIN
DESIGNED BY
DRAWN BY
CHECKED BY
SUBMITTED
DATE DEC 1968
SCALE AS SHOWN
DRAWING NO
1960-C3-98/2

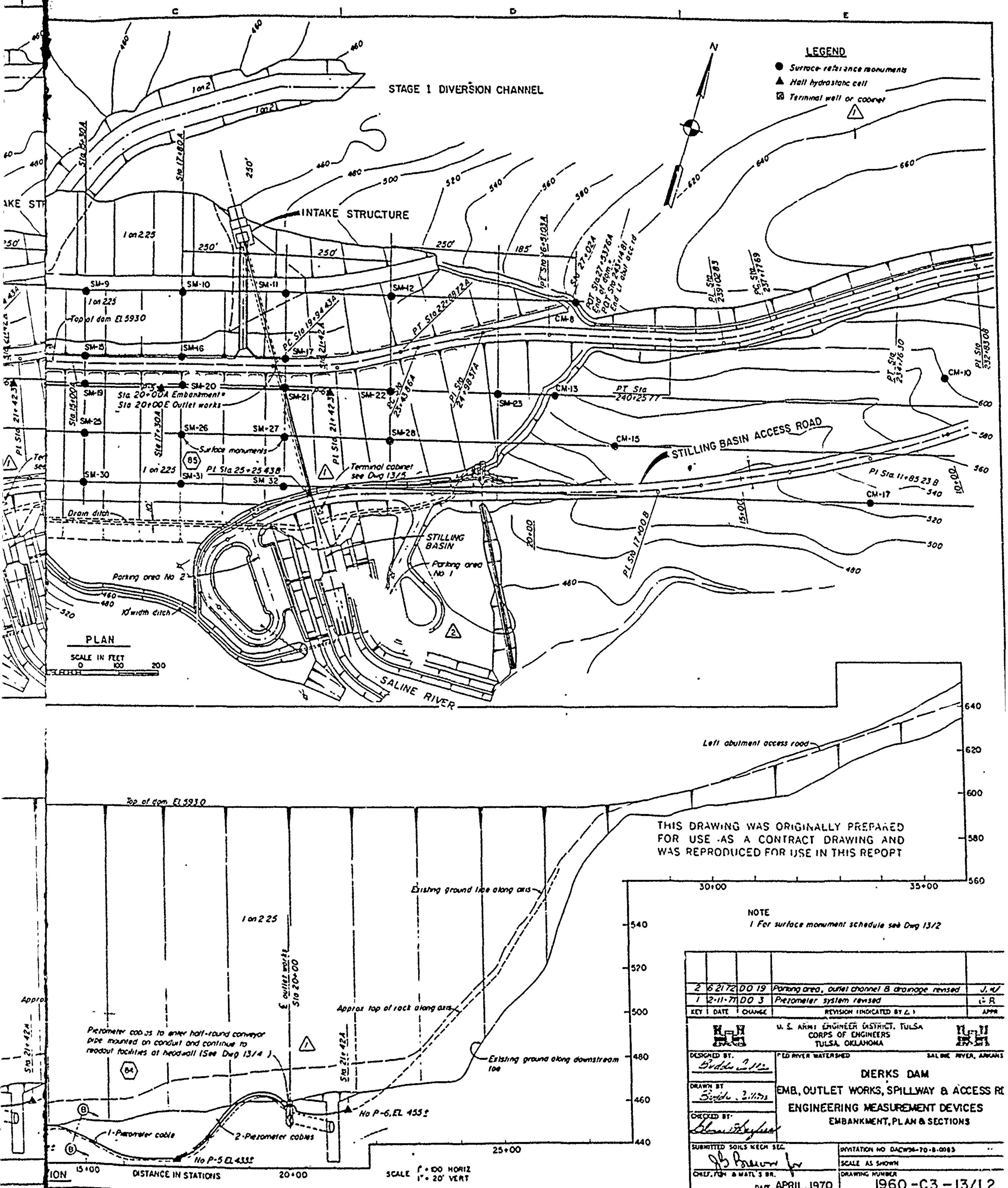

RIGHT EMBANKMENT
PARKING AREA 15 SPACES
MAIN EMBANKMENT
Temporary berm El 529.5
Anchor B-1 El 560.5 Sta 14+4CA
Top of dam El 593.0
N74°16'19"E
STA. 20+00A POT EMBK'T. = STA. 20+00E OUTLET WORKS
STILLING BASIN SERVICE ROAD
STILLING BASIN
PI Sta 25+25.438
PI Sta 5+00A
Δ=18°-00'
D=5°-00'
R=1145.92'
T=181.50'
L=360'
Energy dissipator see detail on Dwg 12/5
Paved ditch transition see Dwg 12/3
℄ stilling basin service road
Till, fertilize & seed (mix No. 2)
Semi-compacted fill to El 458±
Embankment slope
Bermuda mulch sodding
Existing ground surface
Parking area No 2
Random fill
Filter 'C'
Filter 'A'
Select rock
6" perforated plastic pipe
Existing ground line
Concrete ditch see details on Dwg 12/5
SECTION C-C
SECTION B-B
PLAN
SCALE IN FEET
ELEVATION IN FEET M.S.L.
Top of dam El 593.0
Special ditch 5% slope
Existing ground surface along axis of dam
Existing ground surface along D S toe of embankment
Earthwork Estimate
Sta 6+15A to Sta 9+00A
Excavation = 10,863 CY
Embankment = 0
DOWNSTREAM ELEVATION
DISTANCE IN STATIONS
℄ outlet works



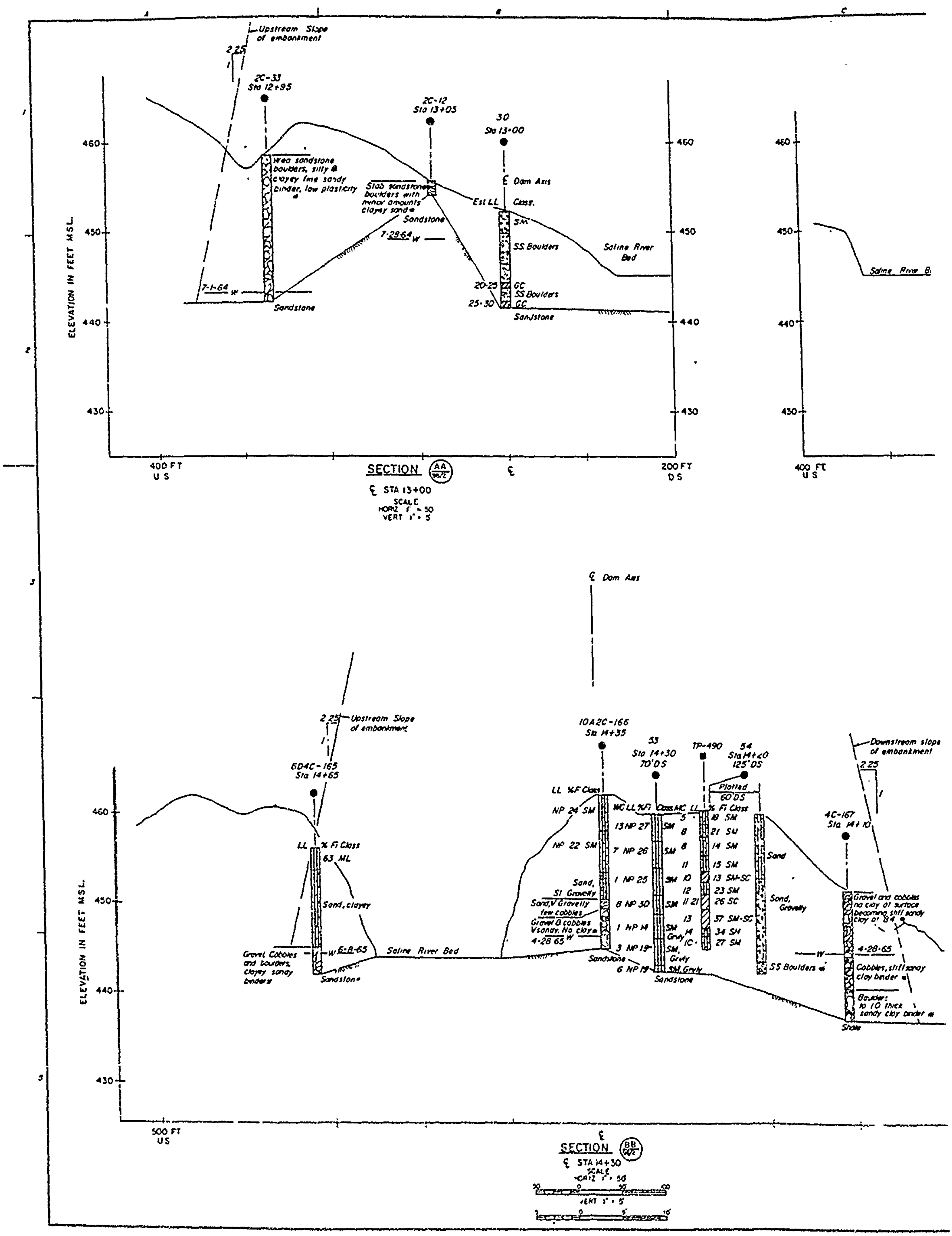
EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 3



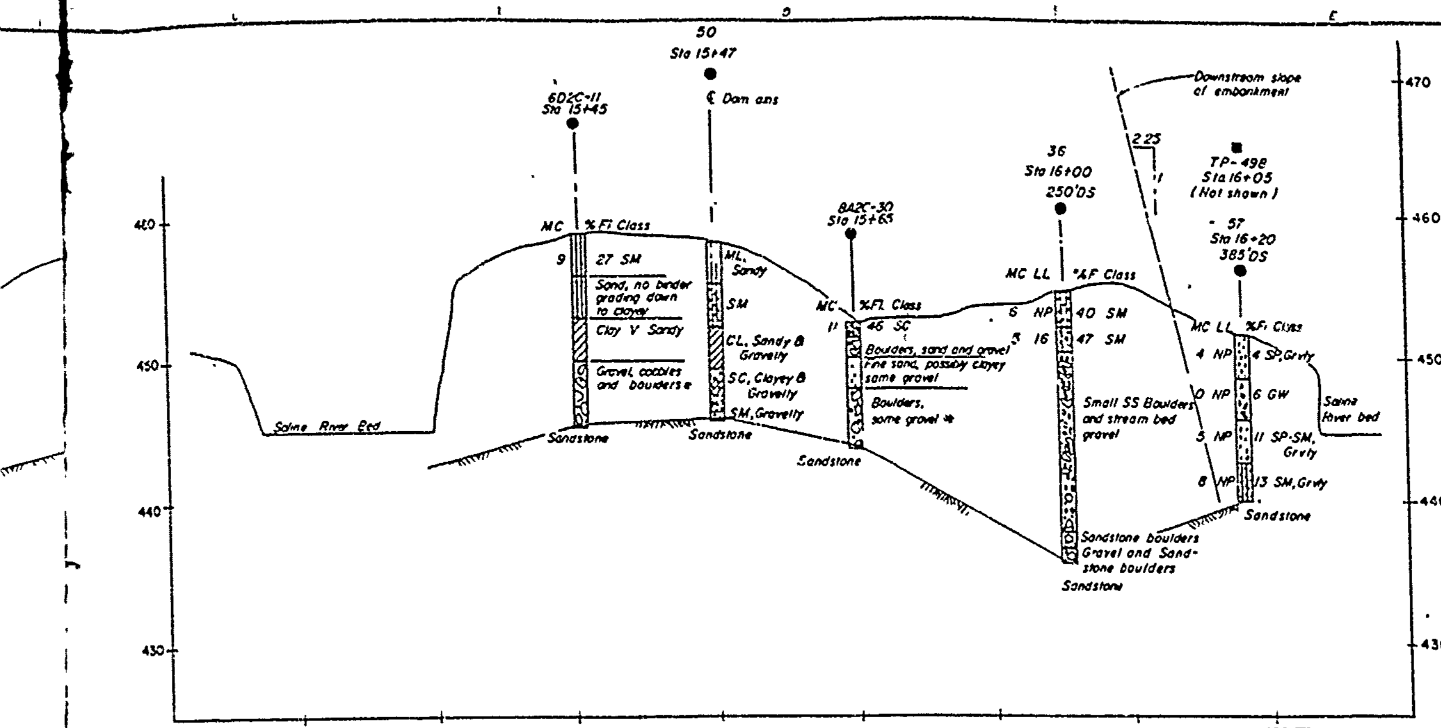
RIGHT EMBANKMENT
MAIN EMBANKMENT
Top of dam EL 593.0
Sta 20+00A Embankment = Sta 20+00E Outlet works
Terminal well see Dwg 13/2
Surface monument
Drain ditch
Parking area No 2
10' width ditch
Piezometer cable
Hand placed backfill
Filter "A"
SECTION B-B
NO SCALE
Abutment rock line
2-1 Flexible metal conduits placed side by side on rockline in inclined filter
NOTE
Filter material to be hand tamped around conduit
SECTION A-A
NO SCALE
PLAN
SCALE IN FEET
100 0 100 200
ELEVATION IN FEET M.S.L.
Top of dam El 593.0
Special ditch 0.5% slope
1 on 3
Existing ground surface along axis of dam
Existing ground surface along D.S toe of embankment
No P-2 EL 530.0
Sta 6+40A,EL 535.0
Piezometer cables
No P-1 EL 520.0
Piezometer cable
No P-3 EL 465±
No P-4, EL 442±
1-Piezometer cable
No P-5,EL 433±
DOWNSTREAM ELEVATION
DISTANCE IN STATIONS
Piezometer cables to enter half-round conveyor pipe mounted on conduit and continue to readout facilities at headwall (See Dwg 13/4



LEGEND
Surface reference monuments
Hall hydrostatic cell
Terminal well or cabinet
STAGE I DIVERSION CHANNEL
INTAKE STRUCTURE
STILLING BASIN ACCESS ROAD
STILLING BASIN
Parking area No 1
Parking area No 2
10' width ditch
Drain ditch
Top of dam El 593.0
Sta 20+00A Embankment
Sta 20+00E Outlet works
Surface monuments
Terminal cabinet see Dwg 13/5
SALINE RIVER
PLAN
SCALE IN FEET
Left abutment access road
Top of dam El 593.0
THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT
Existing ground line along axis
Approx top of rock along axis
Existing ground along downstream toe
Piezometer cables to enter half-round conveyor pipe mounted on conduit and continue to readout facilities at headwall (See Dwg 13/4)
1-Piezometer cable
2-Piezometer cables
No P-6, EL 455±
No P-5 EL 433±
DISTANCE IN STATIONS
SCALE 1" = 100 HORIZ 1" = 20' VERT
NOTE
1 For surface monument schedule see Dwg 13/2
2 | 6-21-72 | DO 19 | Parking area, outlet channel & drainage revised
1 | 2-11-71 | DO 3 | Piezometer system revised
KEY | DATE | CHANGE | REVISION (INDICATED BY △) | APPR
U. S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA
RED RIVER WATERSHED
SALINE RIVER, ARKANSAS
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RD
ENGINEERING MEASUREMENT DEVICES
EMBANKMENT, PLAN & SECTIONS
DESIGNED BY
DRAWN BY
CHECKED BY
SUBMITTED SOILS MECH SEC
CHIEF, FDN & MAT'L'S BR.
INVITATION NO DACW56-70-B-0083
SCALE AS SHOWN
DRAWING NUMBER
DATE APRIL, 1970
1960-C3-13/12



Upstream Slope of embankment
2C-33 Sta 12+95
2C-12 Sta 13+05
30 Sta 13+00
Dam Axis
Wea sandstone boulders, silty & clayey fine sandy binder, low plasticity
Slab sandstone boulders with minor amounts clayey sand
Sandstone
Est LL
Class.
SM
SS Boulders
GC
Saline River Bed
Sandstone
ELEVATION IN FEET MSL.
400 FT US
200 FT DS
SECTION AA
STA 13+00
SCALE HORIZ 1" = 50 VERT 1" = 5
Dam Axis
Upstream Slope of embankment
6D4C-165 Sta 14+65
10A2C-166 Sta 14+35
53 Sta 14+30 70' DS
TP-490
54 Sta 14+20 125' DS
Plotted 60' DS
Downstream slope of embankment
4C-167 Sta 14+10
Sand, clayey
Saline River Bed
Gravel Cobbles and boulders, clayey sandy binder
Sandstone
Sand, Sl Gravelly
Sand, V Gravelly few cobbles
Gravel & cobbles Vsandy, No clay
Sand
Sand, Gravelly
SS Boulders
Gravel and cobbles no clay at surface becoming stiff sandy clay at 8'
Cobbles, stiff sandy clay binder
Boulders to 10 thick sandy clay binder
Shale
500 FT US
SECTION BB
STA 14+30
SCALE HORIZ 1" = 50
VERT 1" = 5

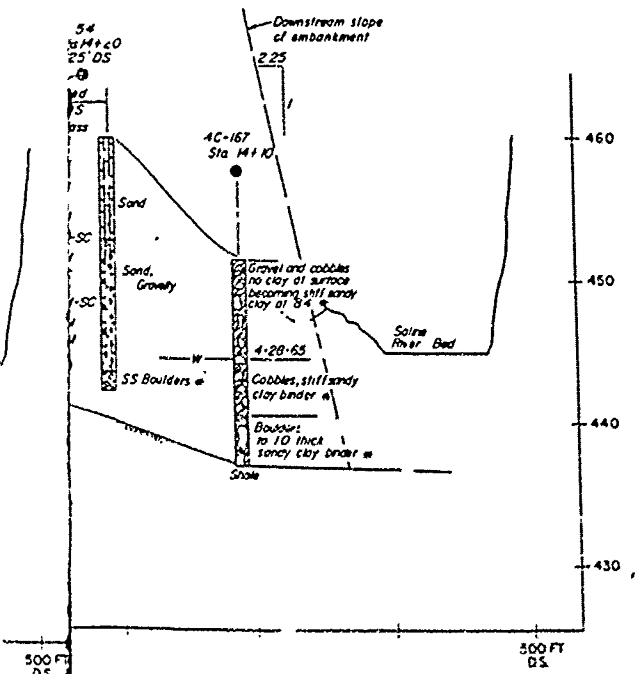


SECTION ℄ (CC / 98/2)
℄ STA 15+45
SCALE
HORZ 1" = 50'
VERT 1" = 5'

LEGEND

LABORATORY CLASSIFICATION

GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
GM	Silty gravels, gravel-sand-silt mixtures
GC	Clayey gravels, gravel-sand-clay mixtures
SP	Poorly-graded sands, gravelly sands, little or no fines
SM	Silty sands, sand-silt mixtures
SC	Clayey sands, sand-clay mixtures
ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with silts slight plasticity
CL	Inorganic clays of low plasticity gravelly clays, sandy clays, silty clays, lean clays
CH	Inorganic clays of high plasticity, fat clays
NP	Non-Plastic
*	Visual classification only, from wash samples



NOTE
1 See Dwg 98/2 for additional legend
2 In holes where no water table is shown, the table was not obtained. Absence of water table elevations on logs does not necessarily mean that ground water will not be encountered at the locations and within the vertical reaches of these borings

KEY	DATE	CHANGE	REVISION INDICATED BY	APPR

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

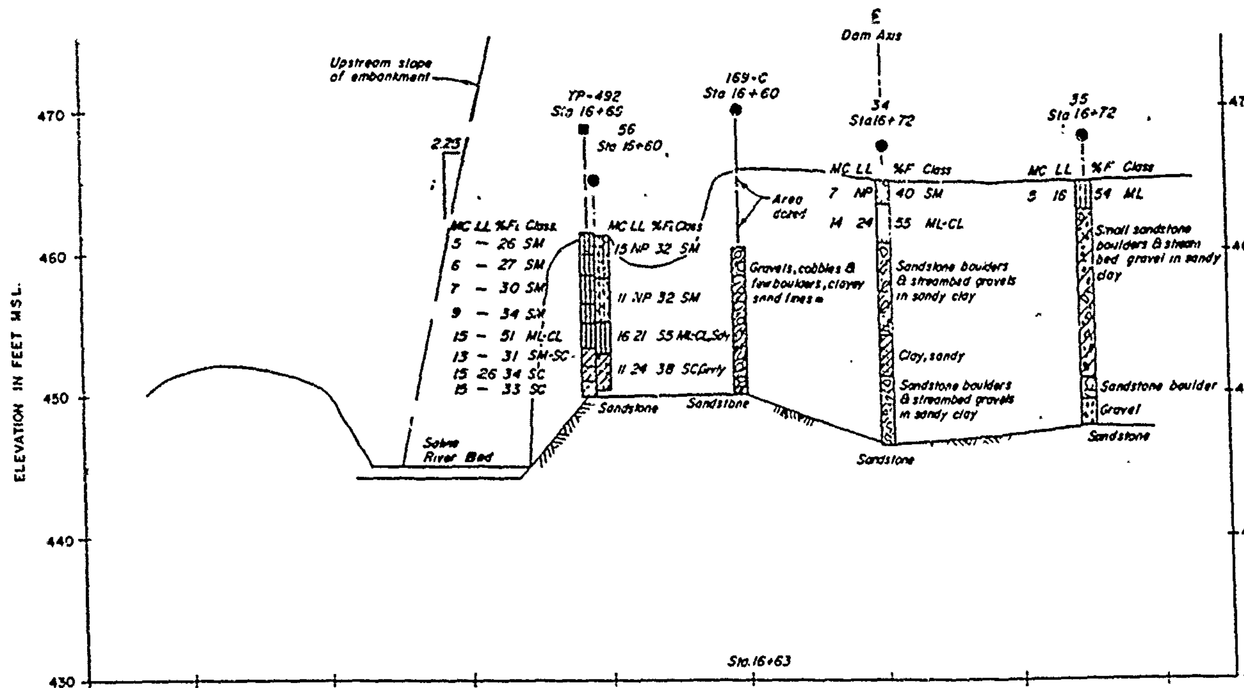
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DESIGNED BY — DRAWN BY — CHECKED BY — CHIEF SOILS MECH SECT — SUBMITTED — CHIEF FDS MATLS BR

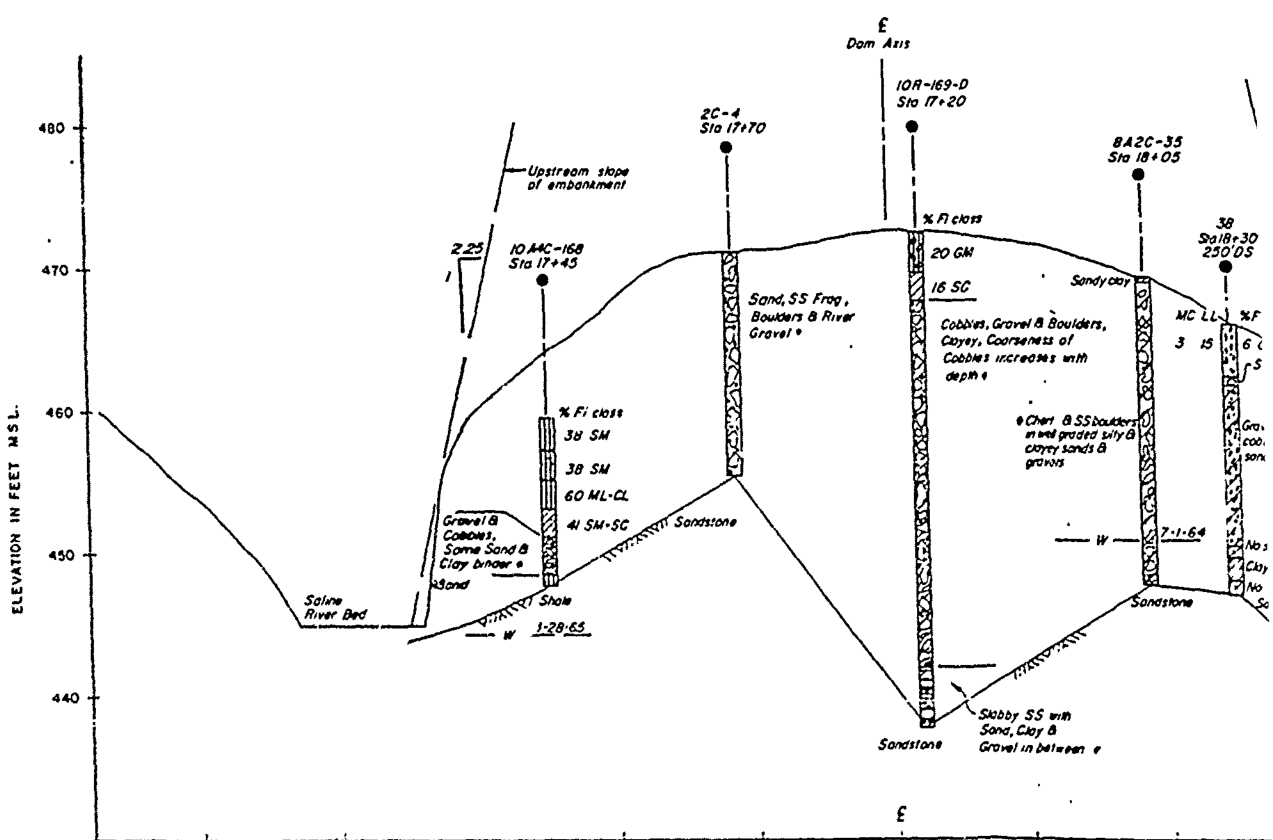
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
OVERBURDEN INVEST.-MAIN EMB. FOUNDATION
SECTIONS AA, BB, & CC - BORINGS & TEST PITS

INVITATION NO DACW 56-[illegible]
SCALE AS SHOWN
DRAWING NO 1960-C3-98/3
DEC 1968

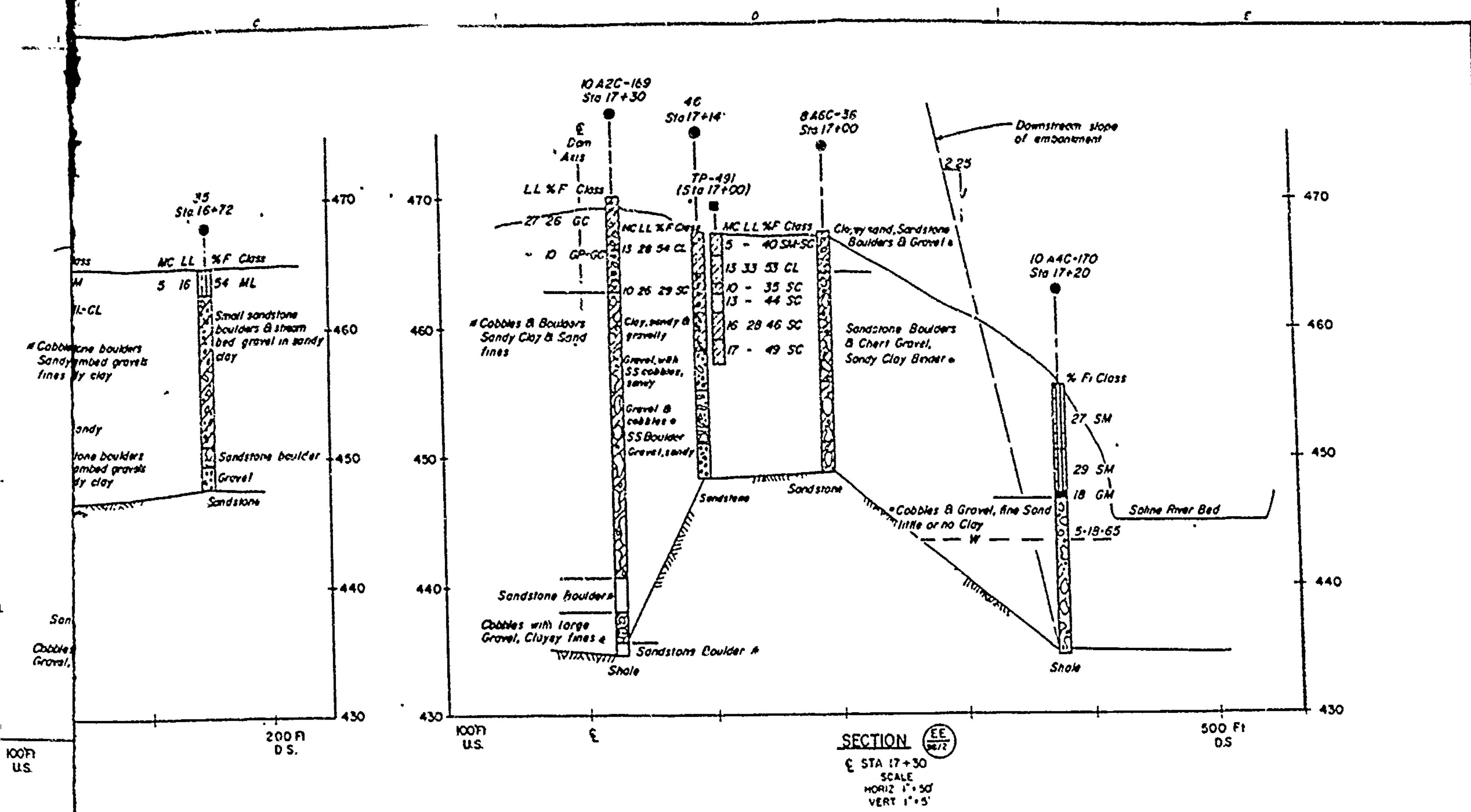
THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

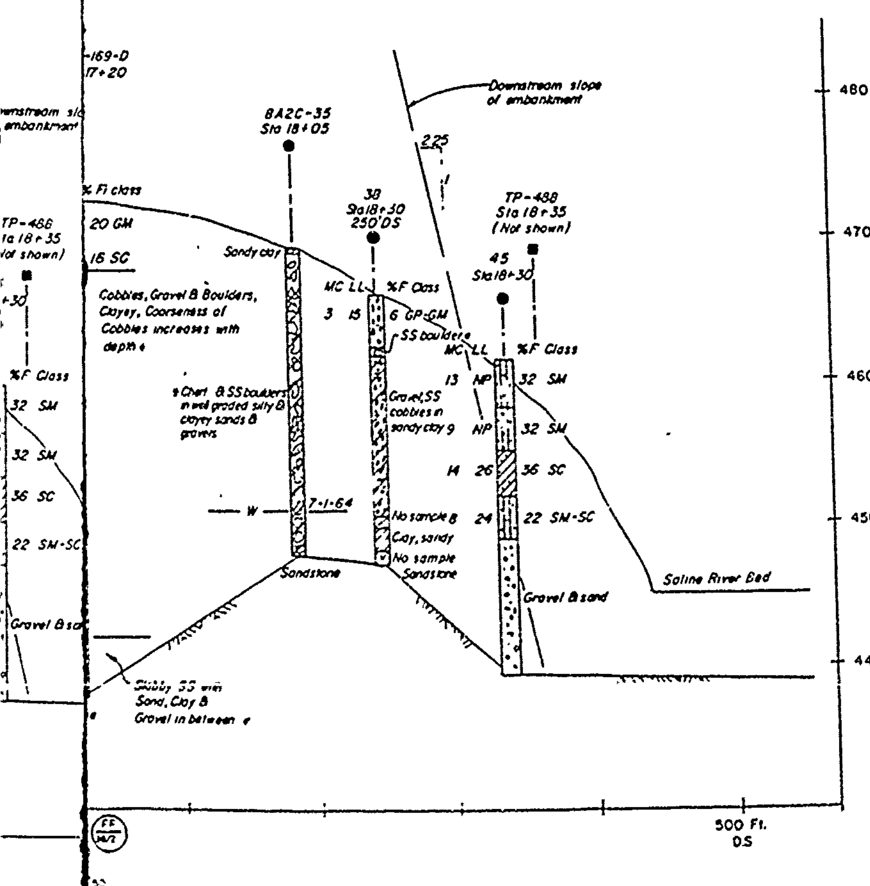


SECTION DD/36-2
℄ STA 16+72
SCALE
HORIZ 1" = 50'
VERT 1" = 5'



SECTION FF/36-2
℄ STA 17+90
SCALE
HORIZ 1" = 50
VERT 1" = 5





NOTES
1. See Dwg 98/2 B3 for legend

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

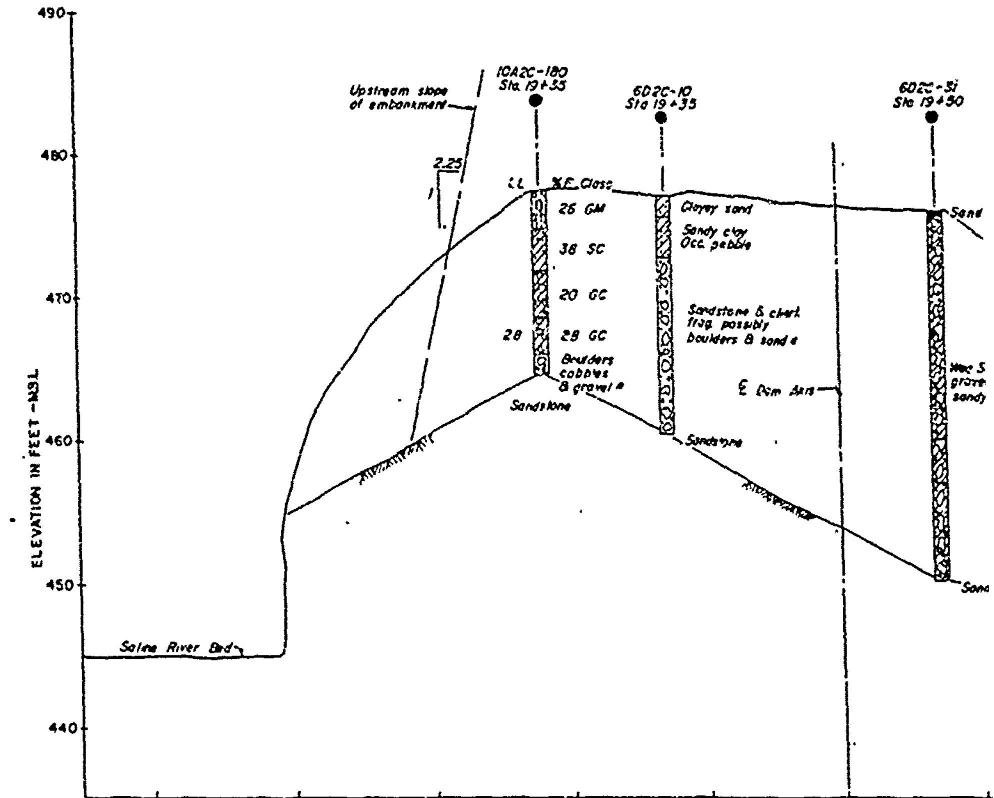
RED RIVER WATERSHED | SALINE RIVER, ARKANSAS

DIERKS DAM

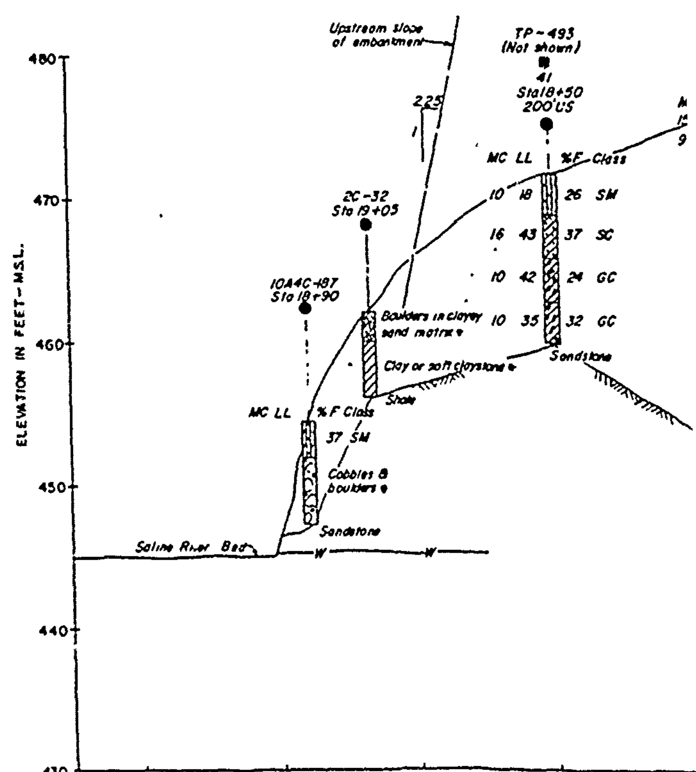
EMB, OUTLET WORKS, SPILLWAY & ACCESS R
OVERBURDEN INVEST-MAIN EMB FOUNDAT
SECTIONS DD, EE, & FF - BORINGS & TEST PITS

INVITATION NO. DACW 56-70-B-0033
SCALE AS SHOWN
DRAWING NO. 1960-C3-98/
DATE DEC 1968

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO.

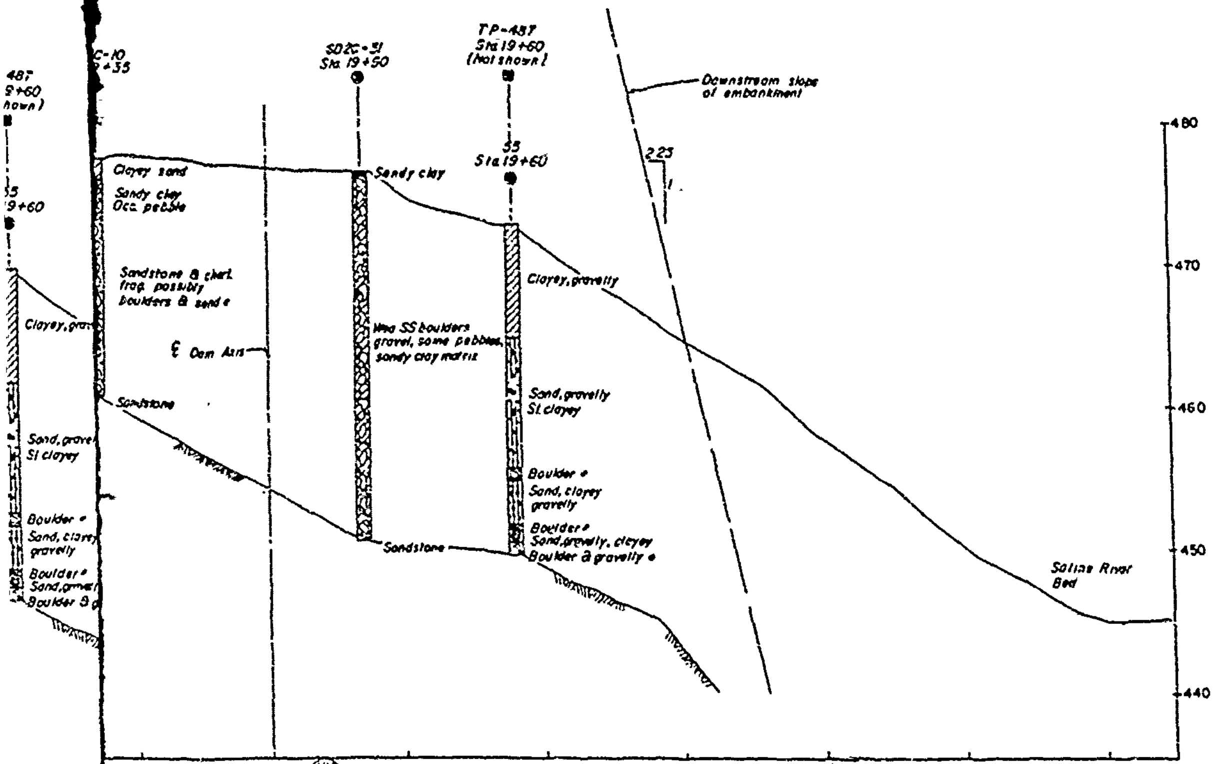


SECTION HH
℄ STA.19+45
SCALE:
HORIZ. 1" = 50'
VERT 1" = 5'

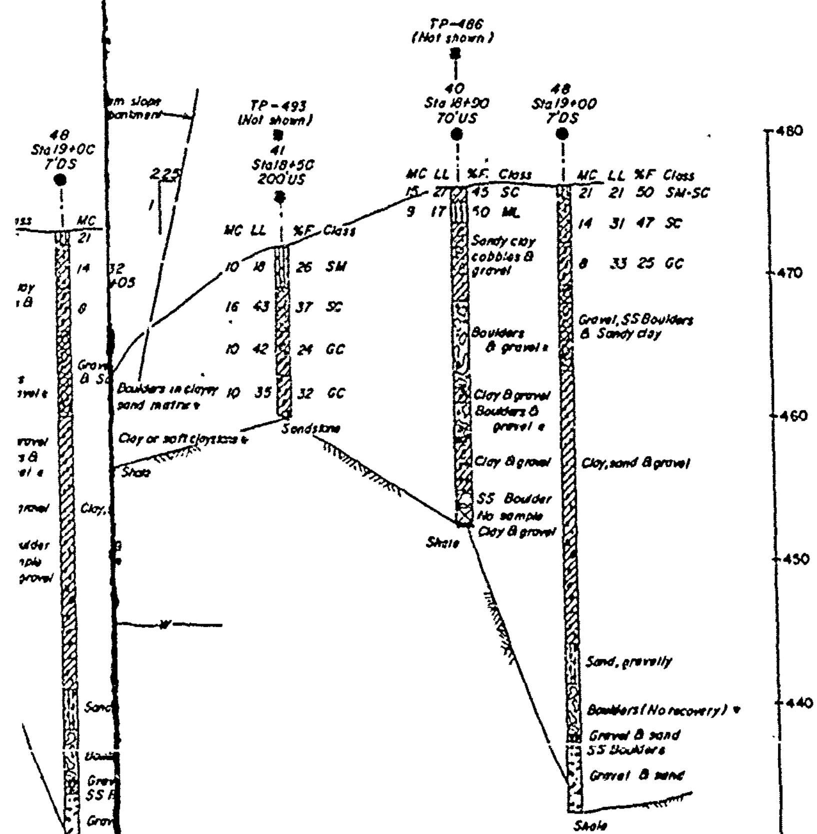


SECTION GG
℄ STA.19+00
SCALE
HORIZ. 1" = 50'
VERT. 1" = 5'

(1)



SECTION HH (98/2)
℄ STA 19+45
SCALE
HORIZ 1" = 50'
VERT 1" = 5'



SECTION GG (98/2)
℄ STA 19+00
SCALE
HORIZ 1" = 50'
VERT 1" = 5'

NOTES
1 See dwg 98/2 & 3 for legend

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

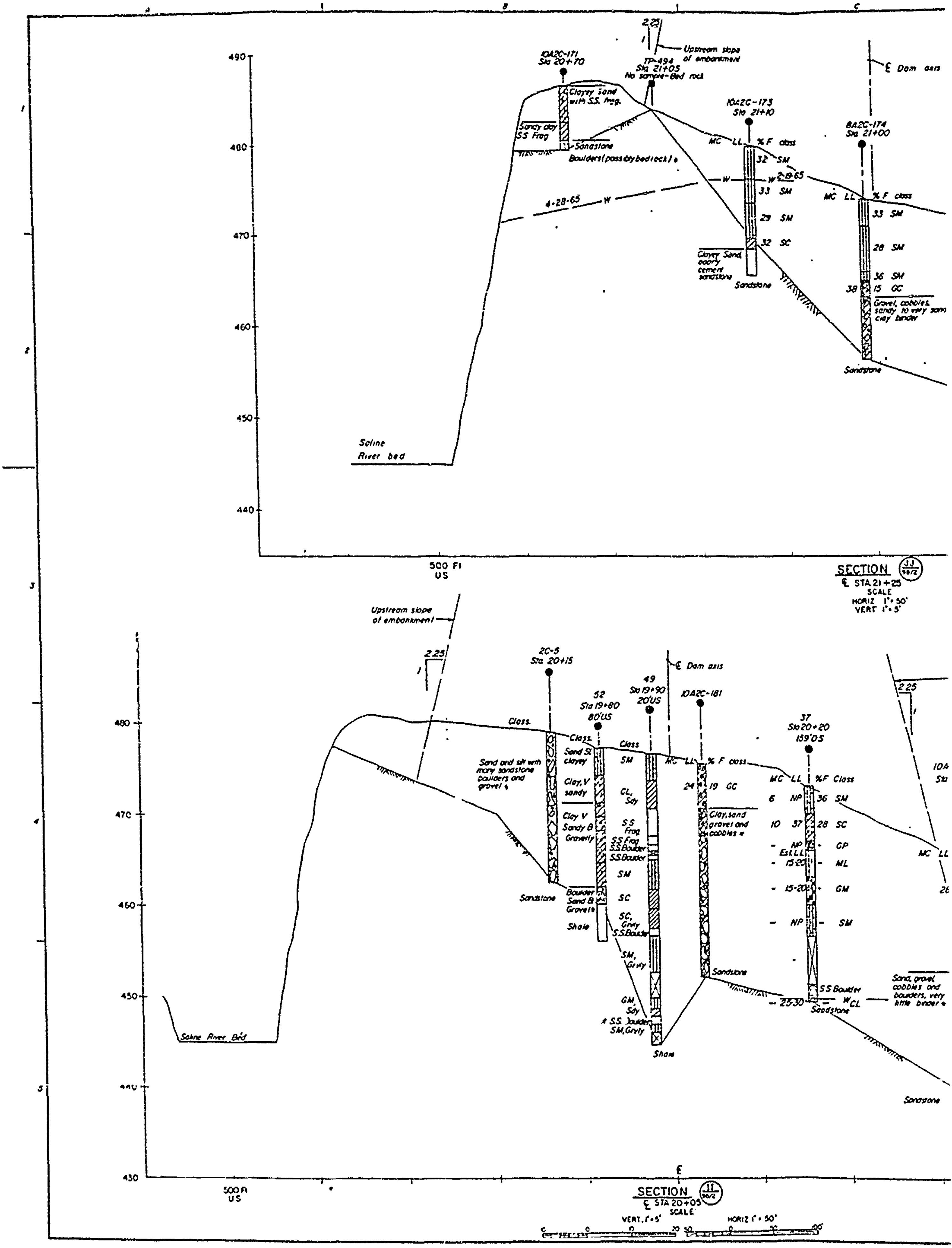
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
OVERBURDEN INVEST.-MAIN EMB FOUNDATION
SECTIONS GG, & HH-BORINGS & TEST PITS

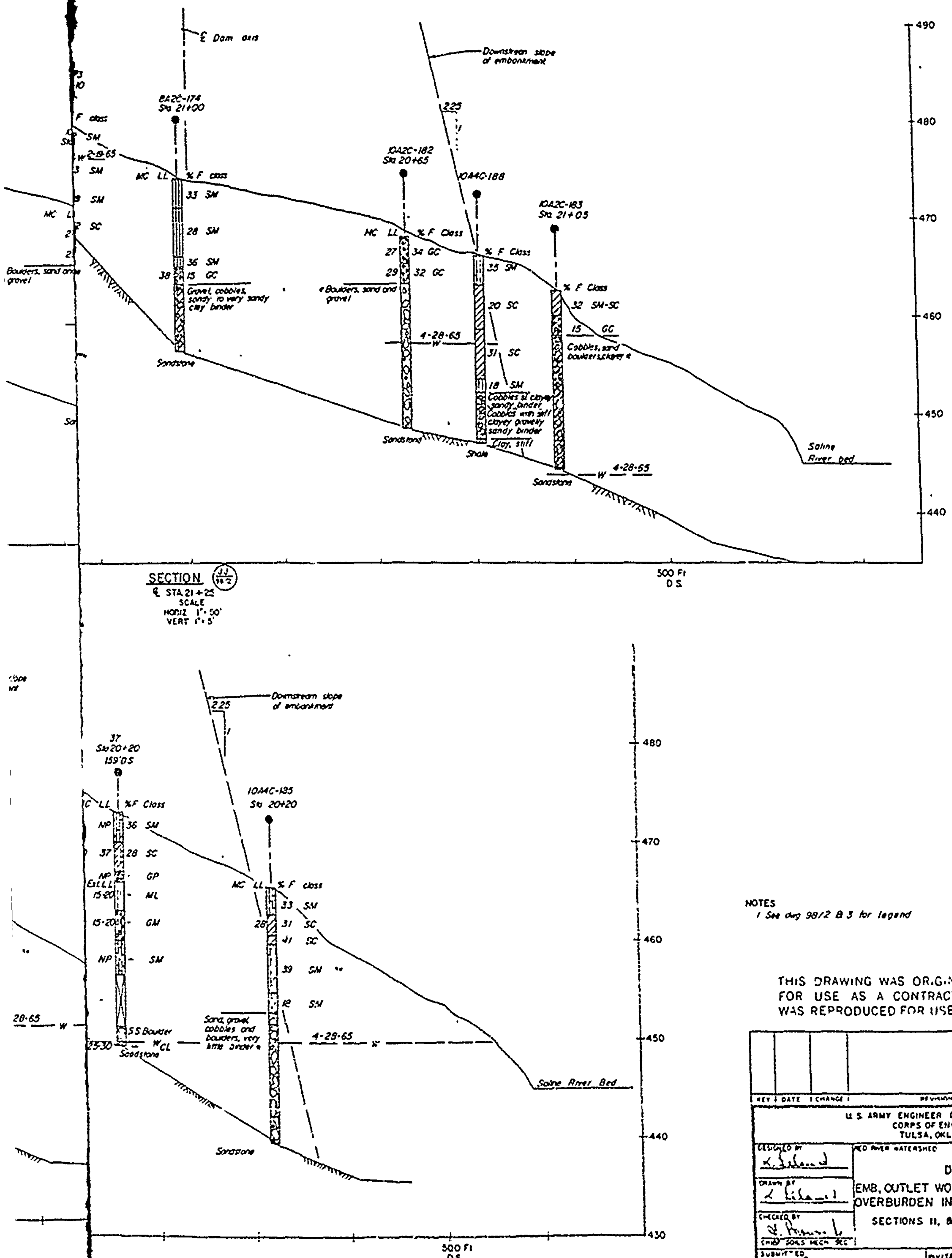
DESIGNED BY
DRAWN BY
CHECKED BY
SUBMITTED
DEC 1968
SCALE AS SHOWN
DRAWING NO 1960-C3-98/5

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 7



10A2C-171
Sta 20+70
TP-494
Sta 21+05
No sample - Bed rock
Upstream slope of embankment
2.25
1
℄ Dam axis
Clayey Sand with SS frag.
Sandy clay SS Frag
Sandstone
Boulders (possibly bedrock)
10A2C-173
Sta 21+10
8A2C-174
Sta 21+00
MC LL %F class
32 SM
33 SM
29 SM
32 SC
2-19-65
4-28-65
W
Clayey Sand, poorly cement sandstone
Sandstone
33 SM
28 SM
36 SM
38 15 GC
Gravel, cobbles, sandy to very sand clay binder
Saline River bed
490
480
470
460
450
440
500 Ft US
SECTION JJ
℄ STA 21+25
SCALE
HORIZ 1" = 50'
VERT 1" = 5'
Upstream slope of embankment
2C-5
Sta 20+15
52
Sta 19+80
80'US
49
Sta 19+90
20'US
10A2C-181
37
Sta 20+20
159'DS
Class.
Sand and silt with many sandstone boulders and gravel
Sand St clayey
Clay, V sandy
Clay V Sandy & Gravelly
Boulder Sand & Gravel
Shale
SM
CL, Sdy
SS Frag
SS Frag
SS Boulder
SS Boulder
SM
SC
SC, Grvly SS Boulder
SM, Grvly
GM, Sdy
SS Boulder
SM, Grvly
Shale
Sandstone
24 19 GC
Clay, sand gravel and cobbles
Sandstone
6 NP 36 SM
10 37 28 SC
GP
ML
GM
SM
SS Boulder
25-30
Sandstone
W CL
Sand, gravel, cobbles and boulders, very little binder
Saline River Bed
430
500 Ft US
SECTION II
℄ STA 20+05
SCALE
VERT 1" = 5'
HORIZ 1" = 50'

1



NOTES
1 See dwg 98/2 B 3 for legend

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION INDICATED BY	

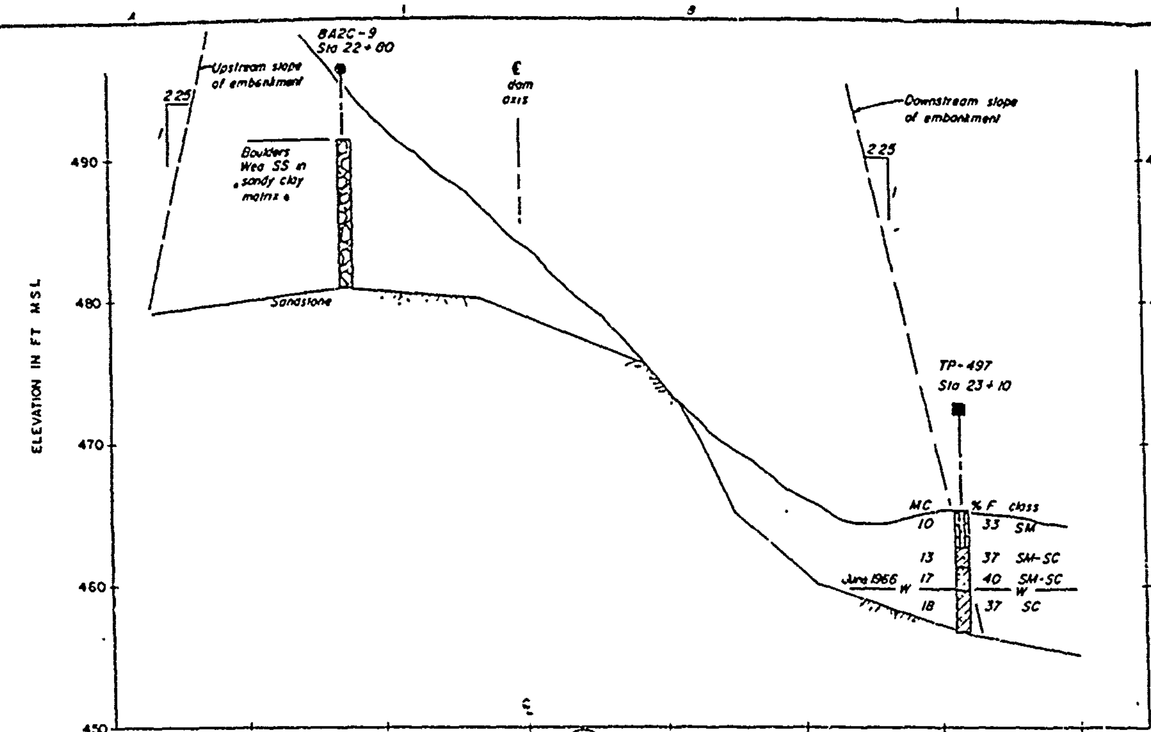
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

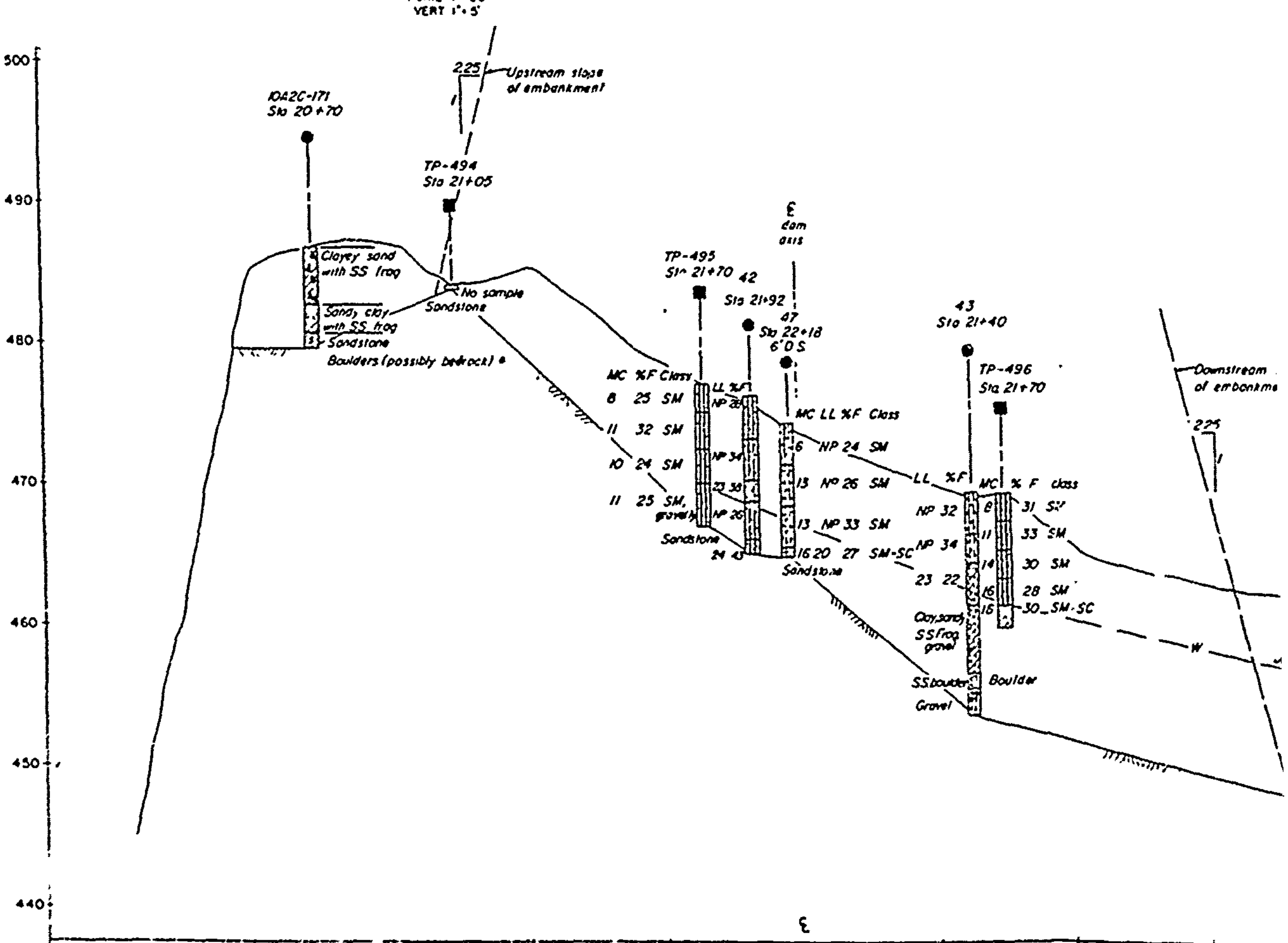
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
OVERBURDEN INVEST.-MAIN EMB. FOUNDATION
SECTIONS II, & JJ-BORINGS & TEST PITS

DESIGNED BY
DRAWN BY
CHECKED BY
CHIEF SOILS MECH SEC
SUBMITTED
CHIEF FND MATLS BR
DEC 1968
INVITATION NO DACW 56-70-B-0033
SCALE AS SHOWN
DRAWING NO 1960—C3—98/6

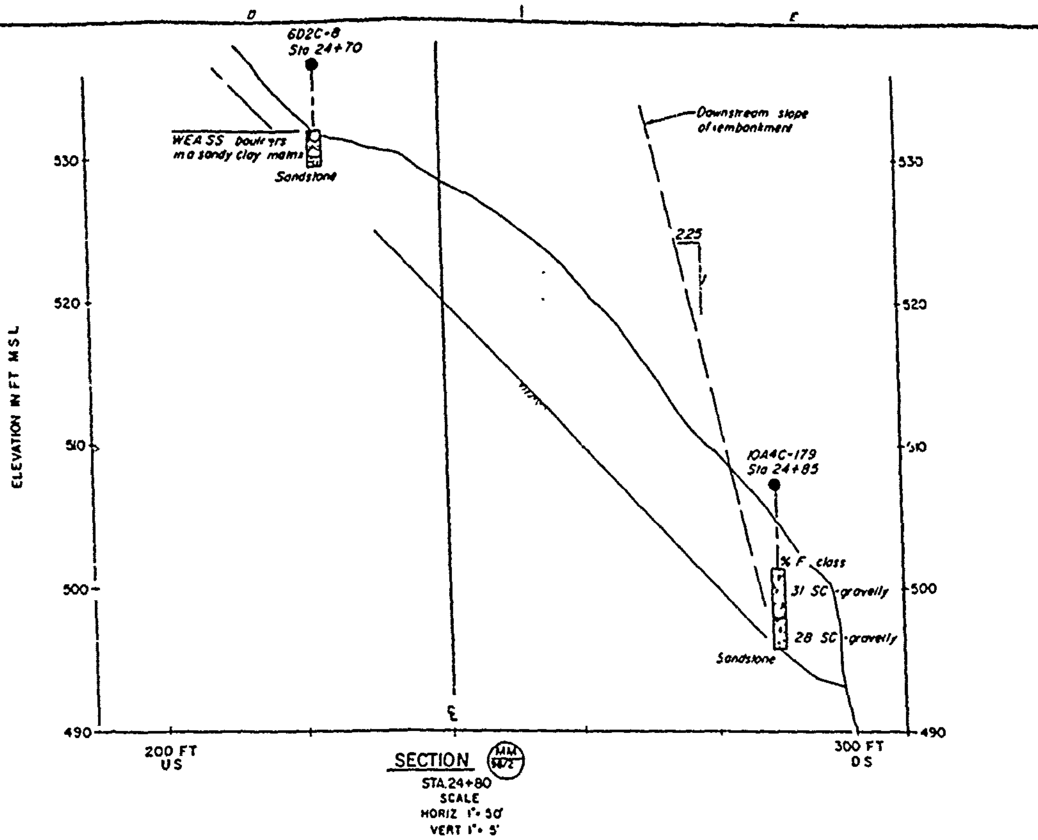
EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 8

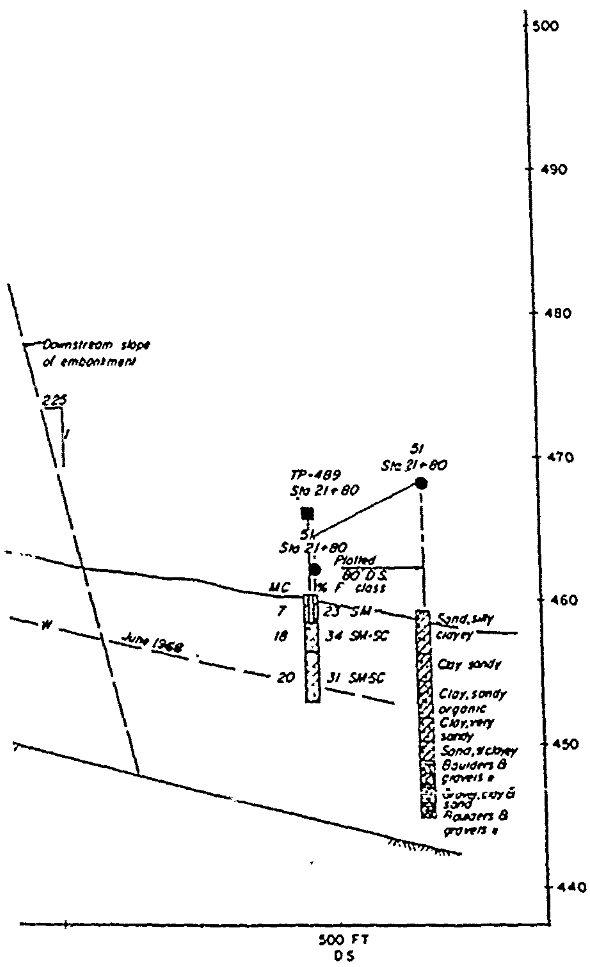


SECTION LL
STA 22+90
SCALE
HORIZ 1" = 50'
VERT 1" = 5'



SECTION KK
STA 21+70
SCALE
HORIZ 1" = 50'
VERT 1" = 5'





NOTES
1 See dwg 98/2 & 3 for legend.

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

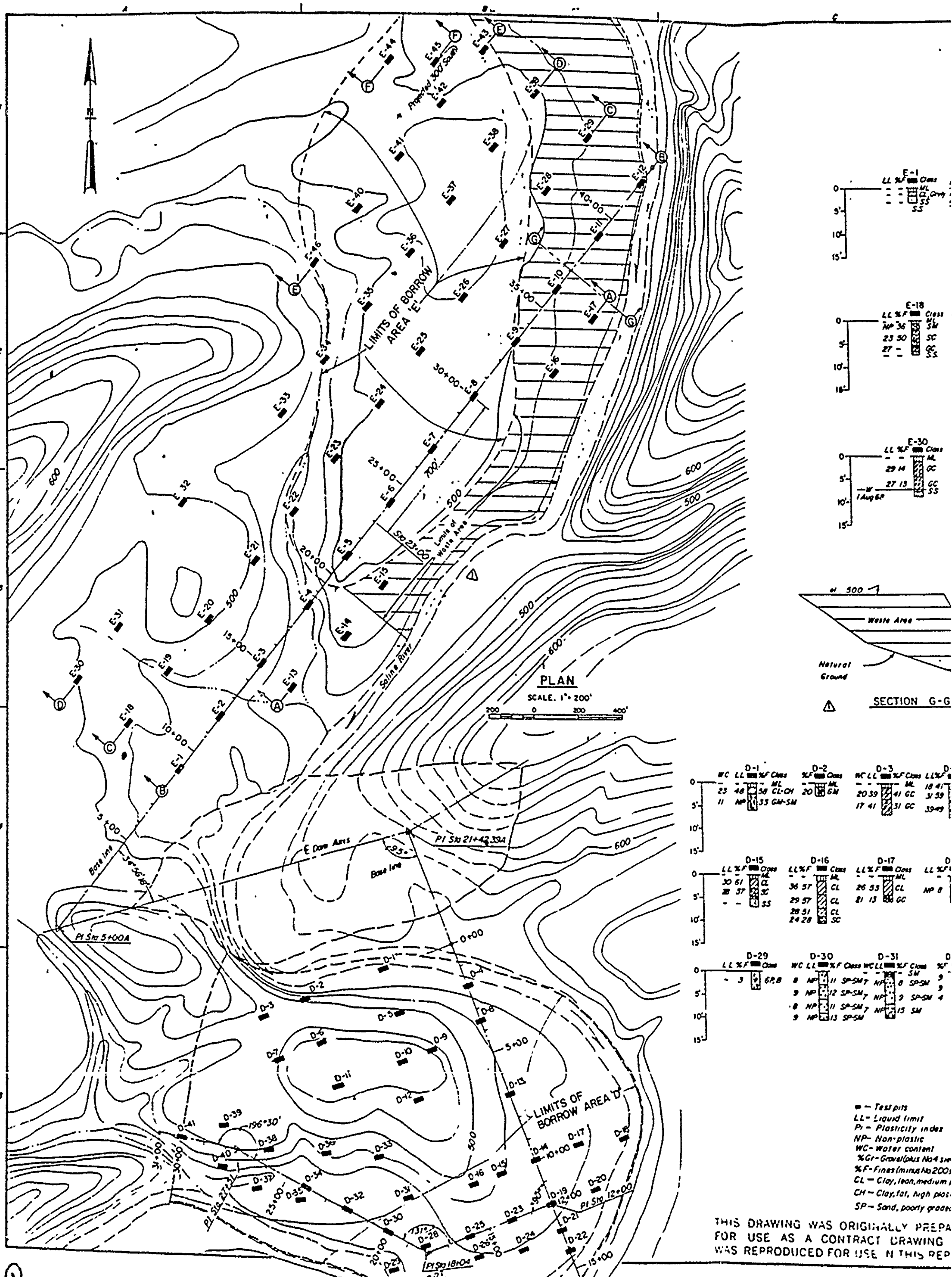
REV · DATE · CHANGE · REVISION INDICATED BY · APPR

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

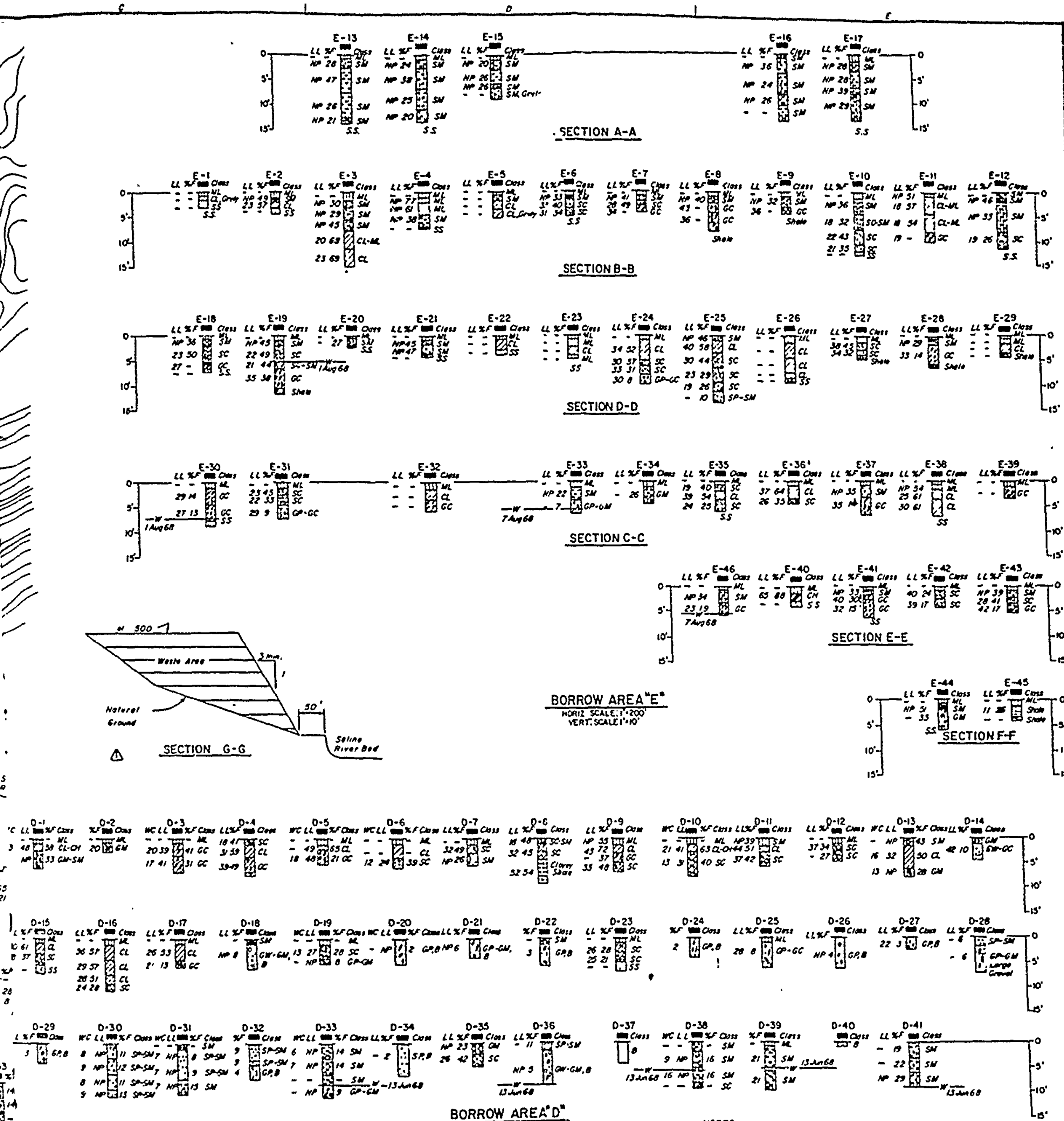
DESIGNED BY · RED RIVER WATERSHED · SALINE RIVER ARKANSAS

DIERKS DAM
EMB., OUTLET WORKS, SPILLWAY & ACCESS RDS
OVERBURDEN INVEST-MAIN EMB. FOUNDATION
SECTIONS LL, MM, & KK - BORINGS & TEST PITS

DRAWN BY
CHECKED BY
CHIEF SOILS MECH
SUBMITTED
CHIEF FND MATLS BR
INVITATION NO. DACW 56-70-B-0033
SCALE AS SHOWN
DRAWING NO.
DATE DEC 1968
1960-C3-98/7



LIMITS OF BORROW AREA 'E'
LIMITS OF BORROW AREA 'D'
PLAN
SCALE, 1" = 200'
Saline River
Limits of Waste Area
Sta 23+00
PI Sta 21+42.39A
PI Sta 5+0.0A
Base line
℄ Dam Axis
Projected 300' South
SECTION G-G
Waste Area
Natural Ground
■ – Test pits
LL – Liquid limit
PI – Plasticity index
NP – Non-plastic
WC – Water content
%Gr – Gravel (plus No 4 sieve)
%F – Fines (minus No 200 sieve)
CL – Clay, lean, medium
CH – Clay, fat, high plasticity
SP – Sand, poorly graded
THIS DRAWING WAS ORIGINALLY PREPA
FOR USE AS A CONTRACT DRAWING
WAS REPRODUCED FOR USE IN THIS REP



NOTES
1. All holes are test pit explorations
2. See Dwg 98/1 for location of Borrow Areas "D" & "E"
3. Class are field classification where laboratory tests are not shown

LEGEND

- ▬ – Test pits
- LL – Liquid limit
- PI – Plasticity index
- NP – Non-plastic
- WC – Water content
- %Gr – Gravel (plus No4 sieve size)
- %F – Fines (minus No 200 sieve size)
- CL – Clay, lean, medium plasticity
- CH – Clay, fat, high plasticity
- SP – Sand, poorly graded
- SM – Sand, silty
- FL – Forest litter
- ML – Silt, clayey to sandy, low plasticity
- SC – Sand, clayey
- GP – Gravel, poorly graded
- GM – Gravel, silty
- GW – Gravel, well graded
- GC – Gravel, clayey
- SS – Sandstone
- B – Boulders (plus 6")
- Sh – Shale
- W – Water table
- (I) – Field classification, no sample taken

4. Borrow area D is primarily a reserve source of sand and gravel for filter materials. Excavation is not to be made in this area until all available sand and gravel has been salvaged from required excavation.

DRAWING WAS ORIGINALLY PREPARED USE AS A CONTRACT DRAWING AND REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	REVISION (INDICATED BY △)	CHKD	REC	APPR
1	5-1-70	Added note number 4.			
1	5-1-70	Added waste area and section G-G			

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
OVERBURDEN INVESTIGATION
BORROW AREAS D&E – PLAN & LOGS

DESIGNED BY / DRAWN BY / CHECKED BY: CHIEF, SOILS MECH SEC

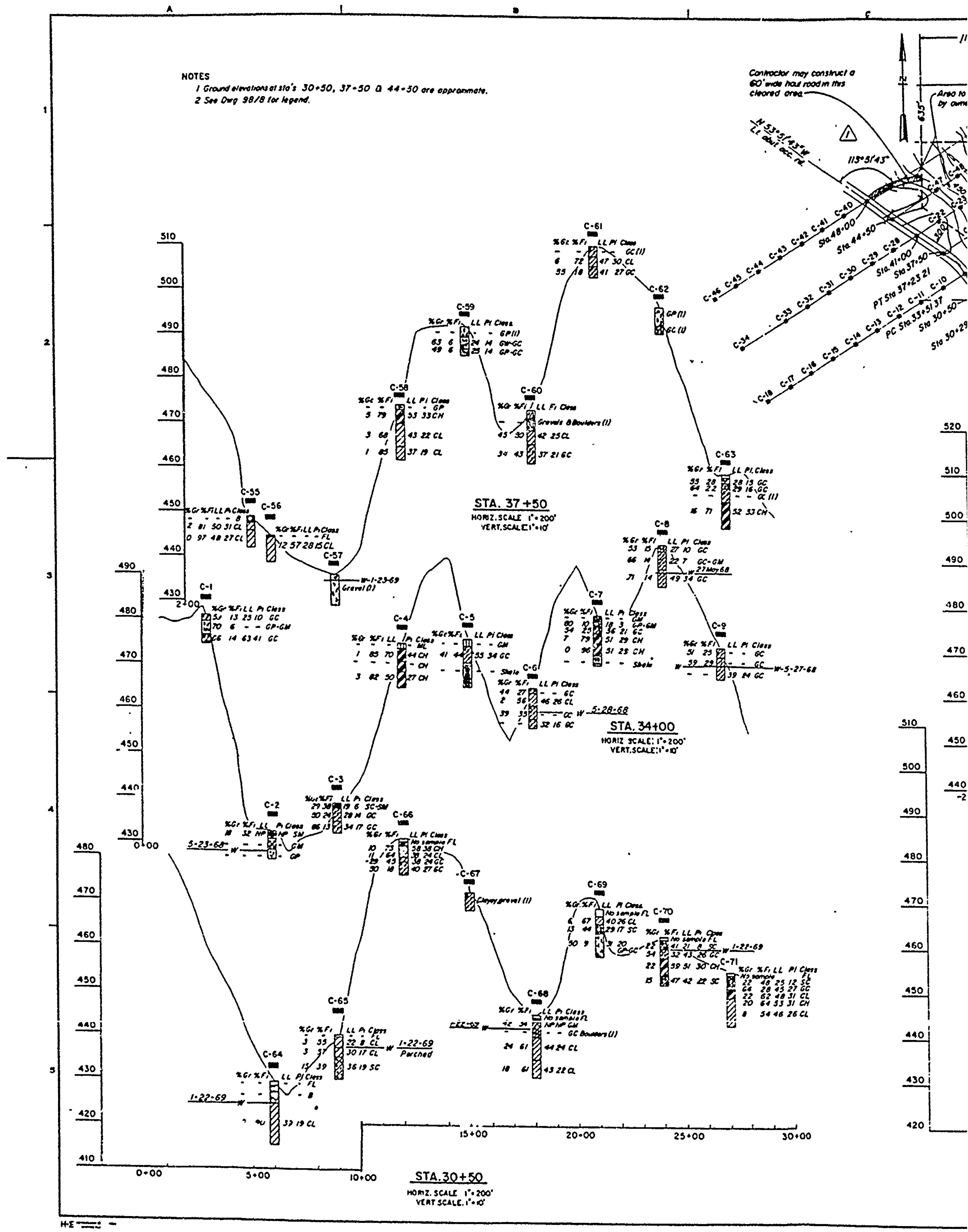
SUBMITTED: CHIEF ENG MATLS BR

DATE DEC 1968

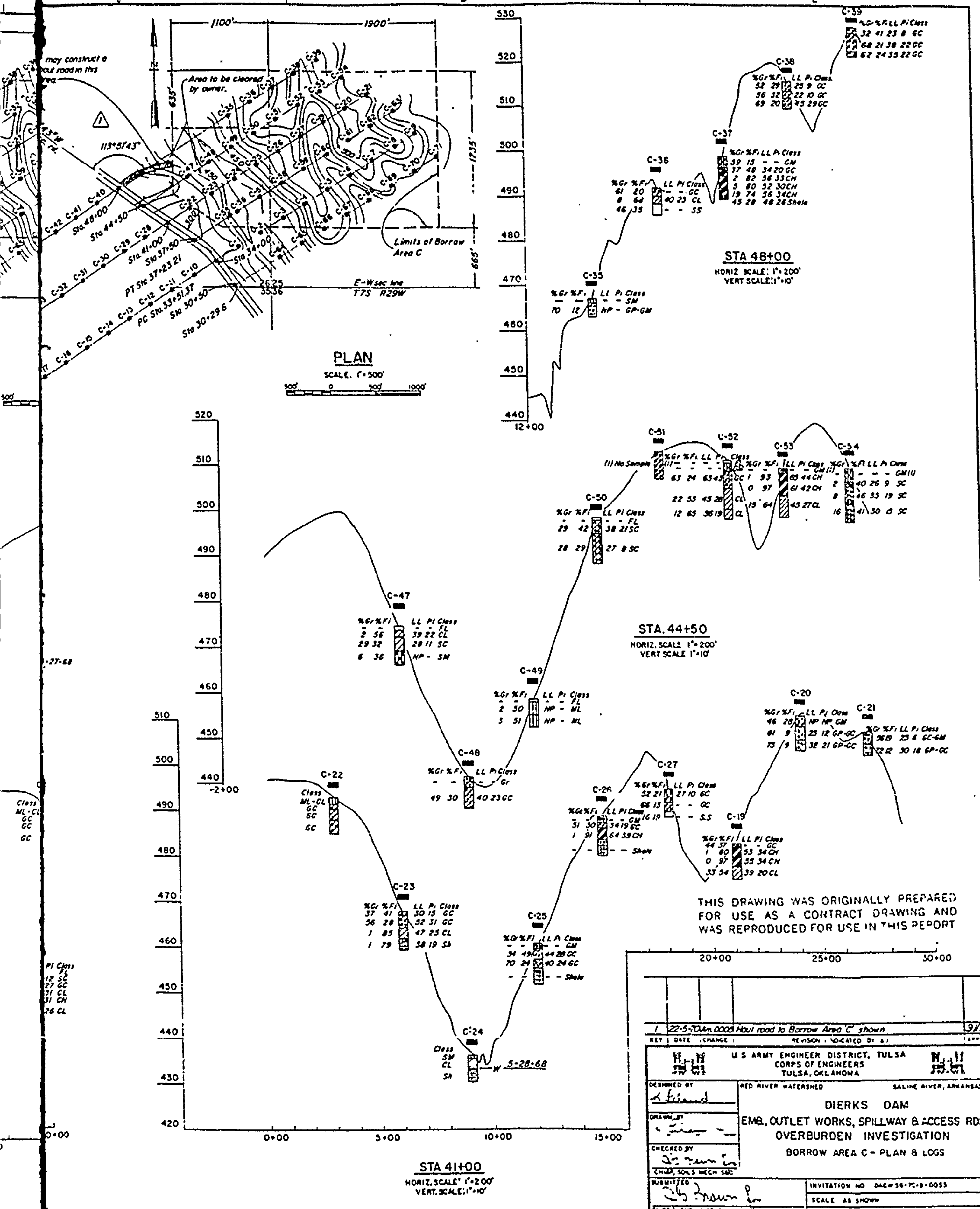
INVITATION NO DACW 56-70-B-0033

SCALE AS SHOWN

DRAWING NO 1960-C3-98/8.1


NOTES
1 Ground elevations at sta's 30+50, 37+50 & 44+50 are approximate.
2 See Dwg 98/8 for legend.
Contractor may construct a 60' wide haul road in this cleared area
STA. 37+50
HORIZ. SCALE 1"=200'
VERT. SCALE 1"=10'
STA. 34+00
HORIZ SCALE 1"=200'
VERT. SCALE 1"=10'
STA. 30+50
HORIZ. SCALE 1"=200'
VERT SCALE 1"=10'

(1)



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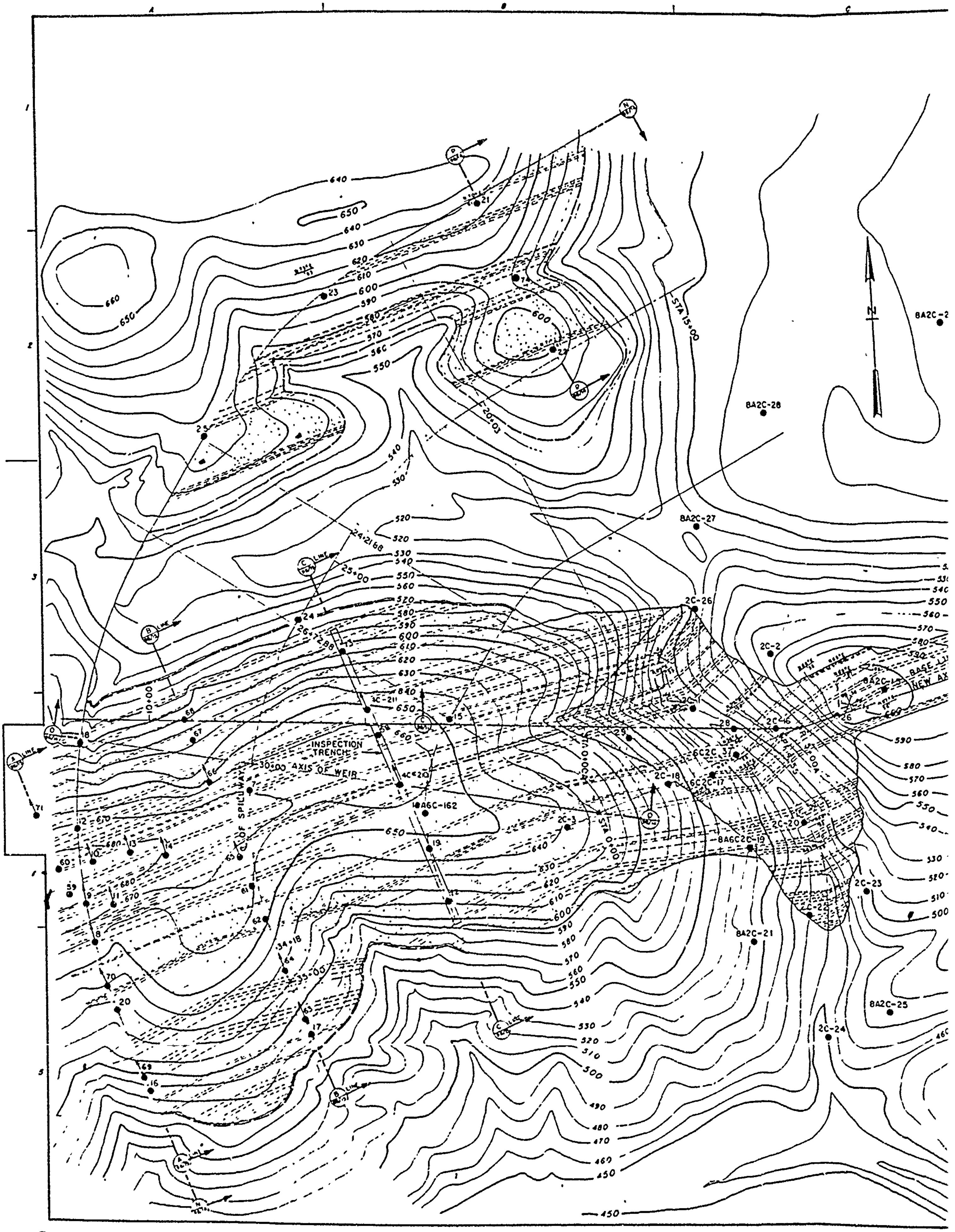
U S ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB., OUTLET WORKS, SPILLWAY & ACCESS RDS
OVERBURDEN INVESTIGATION
BORROW AREA C - PLAN & LOGS

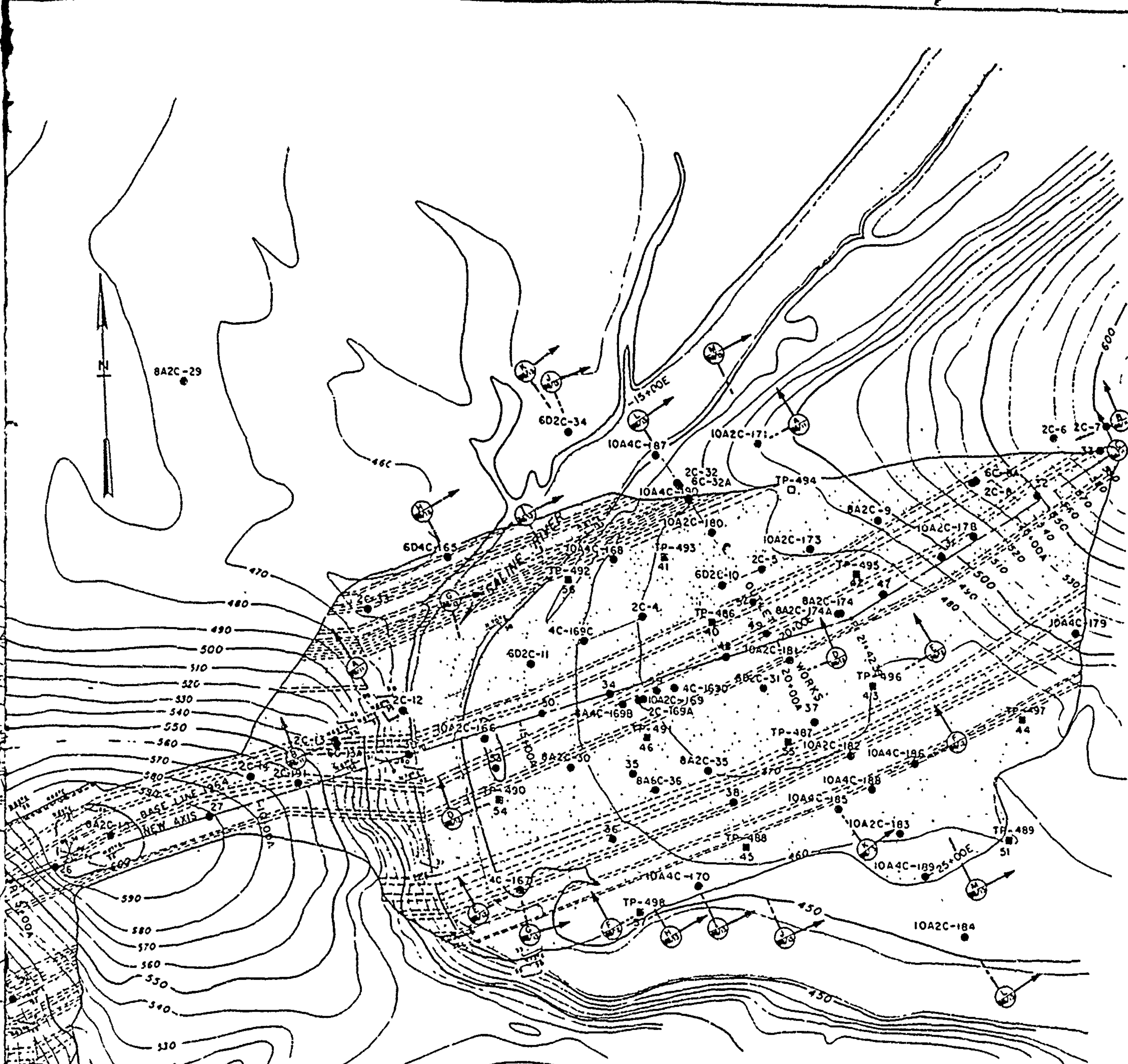
SCALE: AS SHOWN
DRAWING NUMBER 1960-C3-98/9A 1
MAY 1970

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 11



INSPECTION
TRENCH
30+00 AXIS OF WEIR
STA 15+00
STA 0+00
8A2C-28
8A2C-27
8A2C-21
8A2C-25
2C-26
2C-2
2C-3
2C-18
2C-20
2C-23
2C-24
8A6C2C-19
6C2C-17
18A6C-162
10+00
25+00
35+05
34+18
24+21.68
26+22.88
20+03
640
650
660
630
620
610
600
590
580
570
560
550
540
530
520
510
500
490
480
470
460
450

(1)



PLAN

SCALE 1" = 100'

100 0 100 200

NOTE

1 Geology is an interpretation made from borings and outcrops Beds are projected up dip to the top of rock

2 Projection of geologic data between borings on this drawing is presented for the general information of the contractor and is to be considered only as a supplement to the contract drawings The projection of geologic data between borings is the contracting officers interpretations of the general geologic conditions of the location of the section

3 In holes where no water table is shown, the table was not obtained Absense of water table elevations on logs does not necessarily mean that ground water will not be encountered at the locations and within the vertical reaches of these borings

LEGEND

10A2C-9 CORE BORING NUMBER 9 PREFIX INDICATES SIZE AND TYPE BORING, ie C = CORE, A = AUGER D = DEN SON

TP = BACKHOE TEST PIT

CORE BORING IN TEST PIT

CORE BORING SHOWING DIRECTION OF ANGLE HOLE AND 55° FROM VERTICAL

STRIKE AND DIP OF BEDDING

STRIKE AND DIP OF JOINT

STRIKE OF VERTICAL JOINT

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

REV	DATE	CHANGE	REVISION INDICATED BY	APPR

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER ARKANSAS

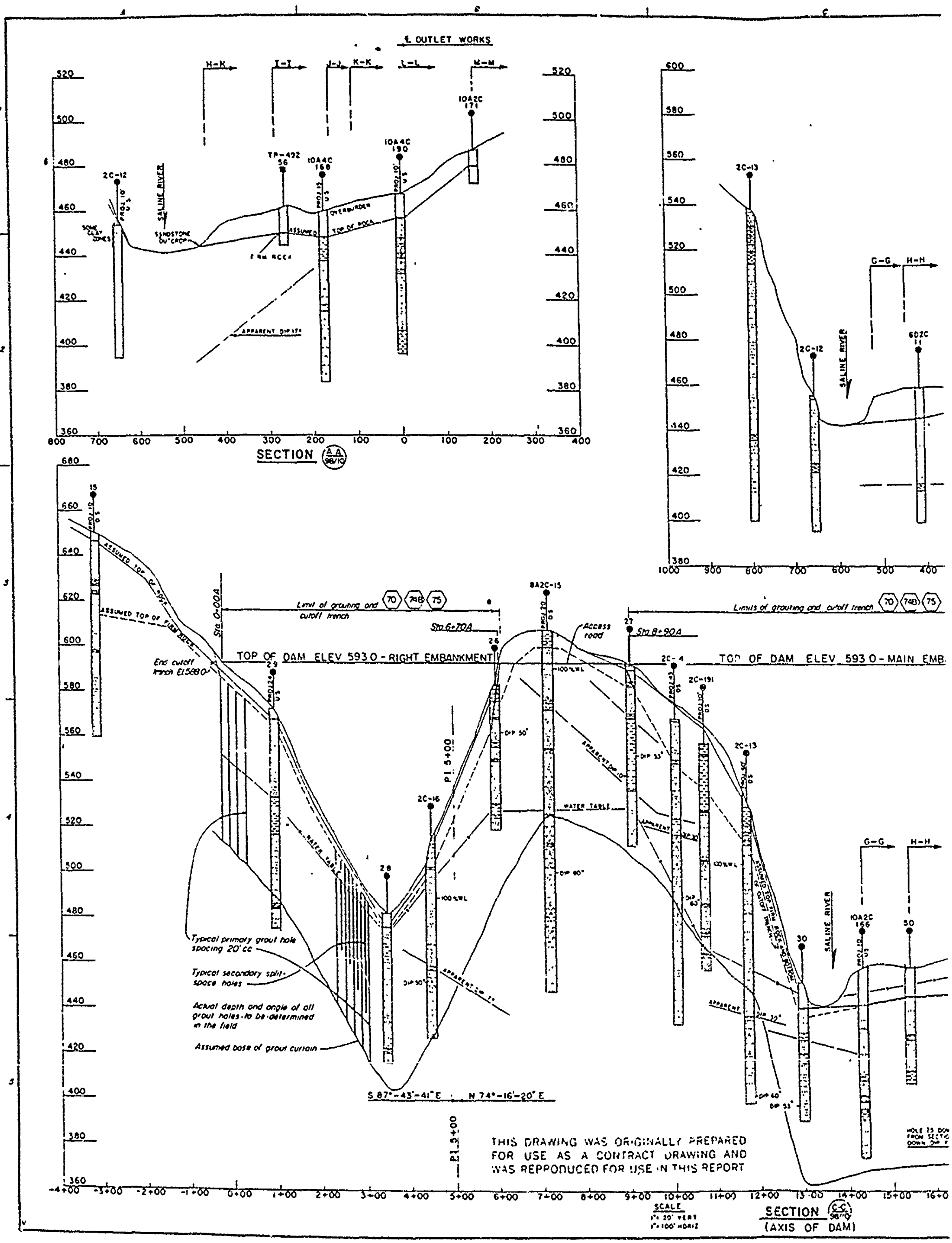
DIERKS DAM
EMB. OUTLET WKS, SPILLWAY & ACCESS ROADS
FOUNDATION EXPLORATION
GENERAL GEOLOGY & PLAN OF EXPLORATION

DESIGNED BY
DRAWN BY
CHECKED BY
CHIEF ENGR GEOLOGY
SUBMITTED
CHIEF, ND MATLS BR

INVITATION NO DACW 56-70-B-0053
SCALE AS SHOWN
DRAWING NO 1960-C3-98/10

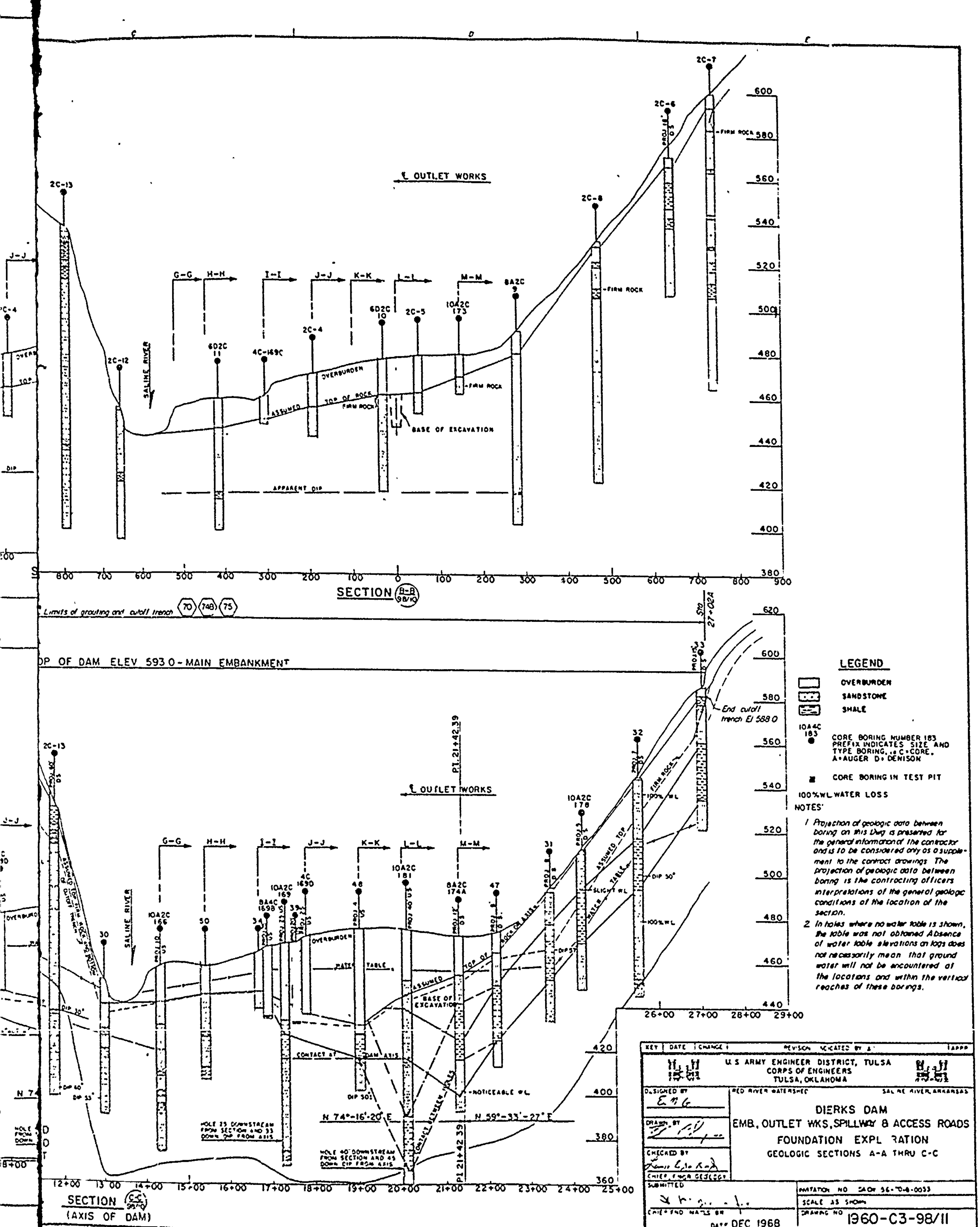
DATE DEC 1968

EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 12

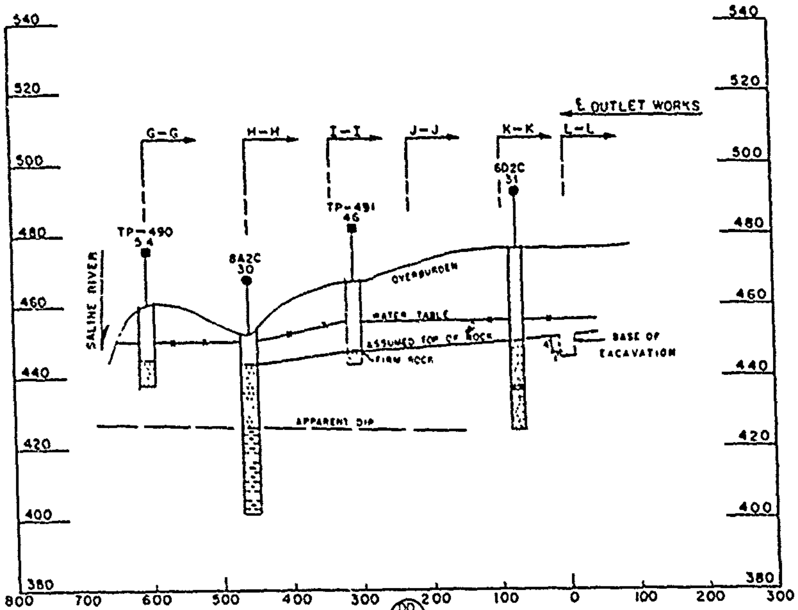


℄ OUTLET WORKS
H-H
I-I
J-J
K-K
L-L
M-M
2C-12
SALINE RIVER
TP-492 56
10A4C 168
10A4C 190
10A2C 171
SOME CLAY ZONES
SANDSTONE OUTCROP
FIRM ROCK
ASSUMED
OVERBURDEN
TOP OF ROCK
APPARENT DIP 17°
SECTION (A-A 98/10)
2C-13
G-G
H-H
6D2C 11
Limit of grouting and cutoff trench (70) (74B) (75)
Limits of grouting and cutoff trench (70) (74B) (75)
Sta 0+00A
Sta 6+70A
Sta 8+90A
8A2C-15
27
Access road
TOP OF DAM ELEV 593.0 - RIGHT EMBANKMENT
TOP OF DAM ELEV 593.0 - MAIN EMB.
End cutoff trench El 588.0'
ASSUMED TOP OF ROCK
ASSUMED TOP OF FIRM ROCK
15
29
26
2C-4
2C-191
2C-16
28
WATER TABLE
APPARENT DIP 10°
P.I. 5+00
Typical primary grout hole spacing 20' cc
Typical secondary split-space holes
Actual depth and angle of all grout holes to be determined in the field
Assumed base of grout curtain
S 87°-43'-41" E
N 74°-16'-20" E
10A2C 166
30
50
THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT
SCALE 1"= 20' VERT 1"=100' HORIZ
SECTION (C-C 98/10)
(AXIS OF DAM)

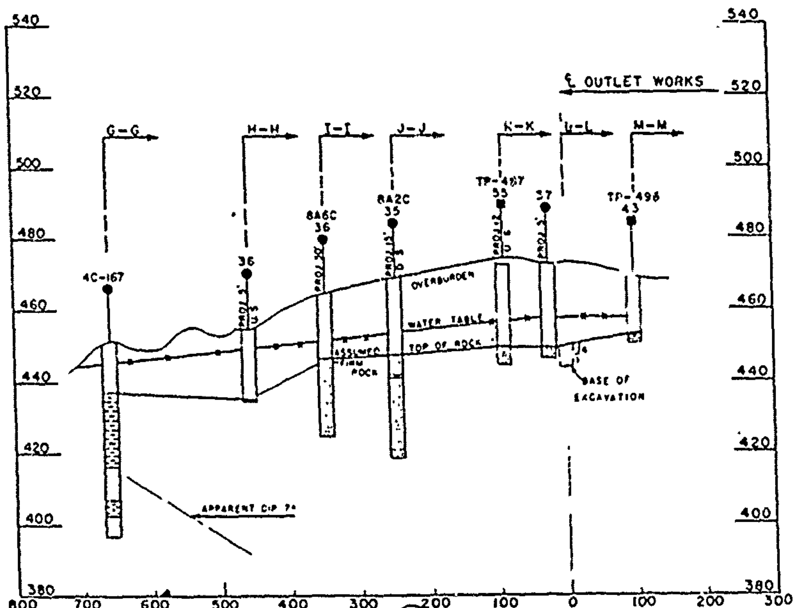
(1)



SECTION B-B 98/10
℄ OUTLET WORKS
APPARENT DIP
BASE OF EXCAVATION
FIRM ROCK
OVERBURDEN
TOP OF ROCK
SALINE RIVER
Limits of grouting and cutoff trench 70 74B 75
TOP OF DAM ELEV 593.0 - MAIN EMBANKMENT
End cutoff trench El 588.0
LEGEND
OVERBURDEN
SANDSTONE
SHALE
10A4C 183 CORE BORING NUMBER 183 PREFIX INDICATES SIZE AND TYPE BORING, i.e. C=CORE, A=AUGER D=DENISON
CORE BORING IN TEST PIT
100%WL WATER LOSS
NOTES:
1. Projection of geologic data between boring on this Dwg is presented for the general information of the contractor and is to be considered only as a supplement to the contract drawings. The projection of geologic data between boring is the contracting officers interpretations of the general geologic conditions of the location of the section.
2. In holes where no water table is shown, the table was not obtained. Absence of water table elevations on logs does not necessarily mean that ground water will not be encountered at the locations and within the vertical reaches of these borings.
WATER TABLE
CONTACT AT DAM AXIS
N 74°-16'-20" E
N 59°-33'-27" E
PI 21+42.39
HOLE 33 DOWNSTREAM FROM SECTION AND 33 DOWN DIP FROM AXIS
HOLE 40' DOWNSTREAM FROM SECTION AND 45 DOWN DIP FROM AXIS
SECTION C-C 98/10 (AXIS OF DAM)
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA
RED RIVER WATERSHED
SALINE RIVER, ARKANSAS
DIERKS DAM
EMB., OUTLET WKS, SPILLWAY & ACCESS ROADS
FOUNDATION EXPLORATION
GEOLOGIC SECTIONS A-A THRU C-C
DATE DEC 1968
SCALE AS SHOWN
1960-C3-98/11

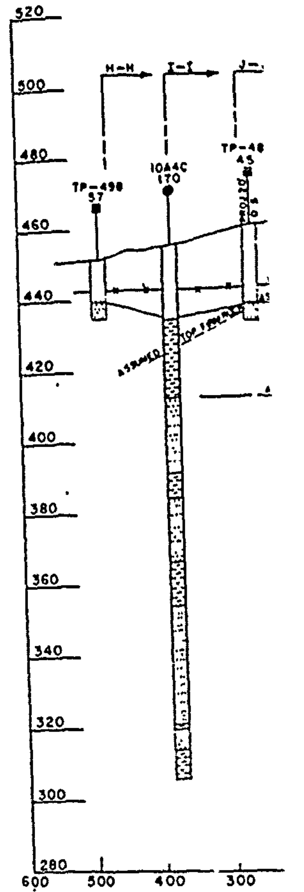


SECTION DD 98/10

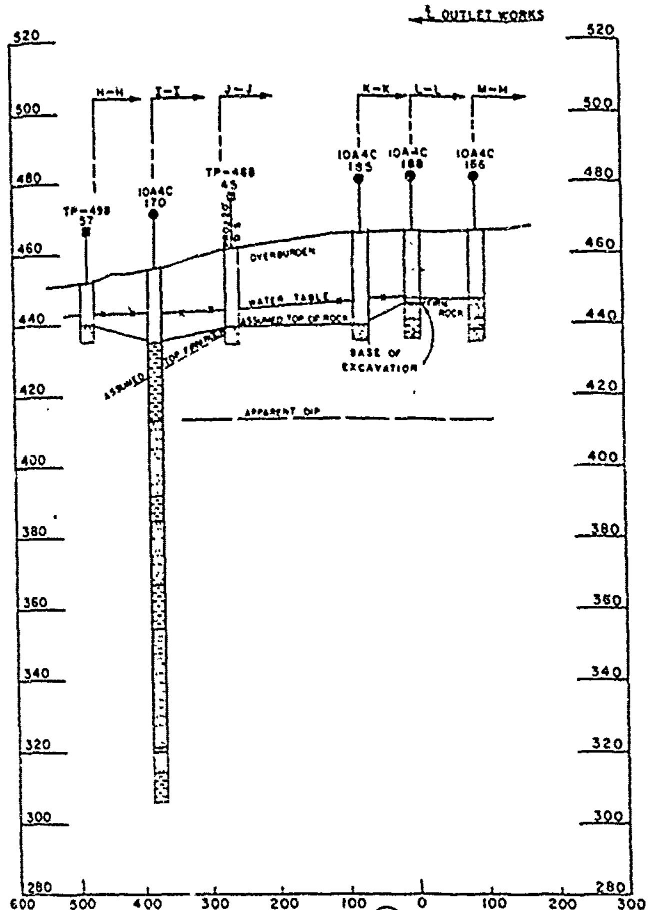


SECTION EE 98/10

SCALE
1" = 20' VERT
1" = 100' HORIZ



(1)



SECTION FF/98-13

LEGEND

- OVERBURDEN
- SANDSTONE
- SHALE

10A4C 183 ● CORE BORING NUMBER 183 PREFIX INDICATES SIZE AND TYPE BORING, i.e. C=CORE, A=AUGER D=DENISON

CORE BORING IN TEST PIT

100%WL WATER LOSS

NOTES

1. *Projection of geologic data between boring on this Dwg is presented for the general information of the contractor and is to be considered only as a supplement to the contract drawings. The projection of geologic data between boring is the contracting officers interpretations of the general geologic conditions of the location of the section.*
2. *In holes where no water table is shown, the table was not obtained. Absence of water table elevations on logs does not necessarily mean that ground water will not be encountered at the locations and within the vertical reaches of these borings.*

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT.

KEY	DATE	CHANGE	REVISION INDICATED BY	APPR

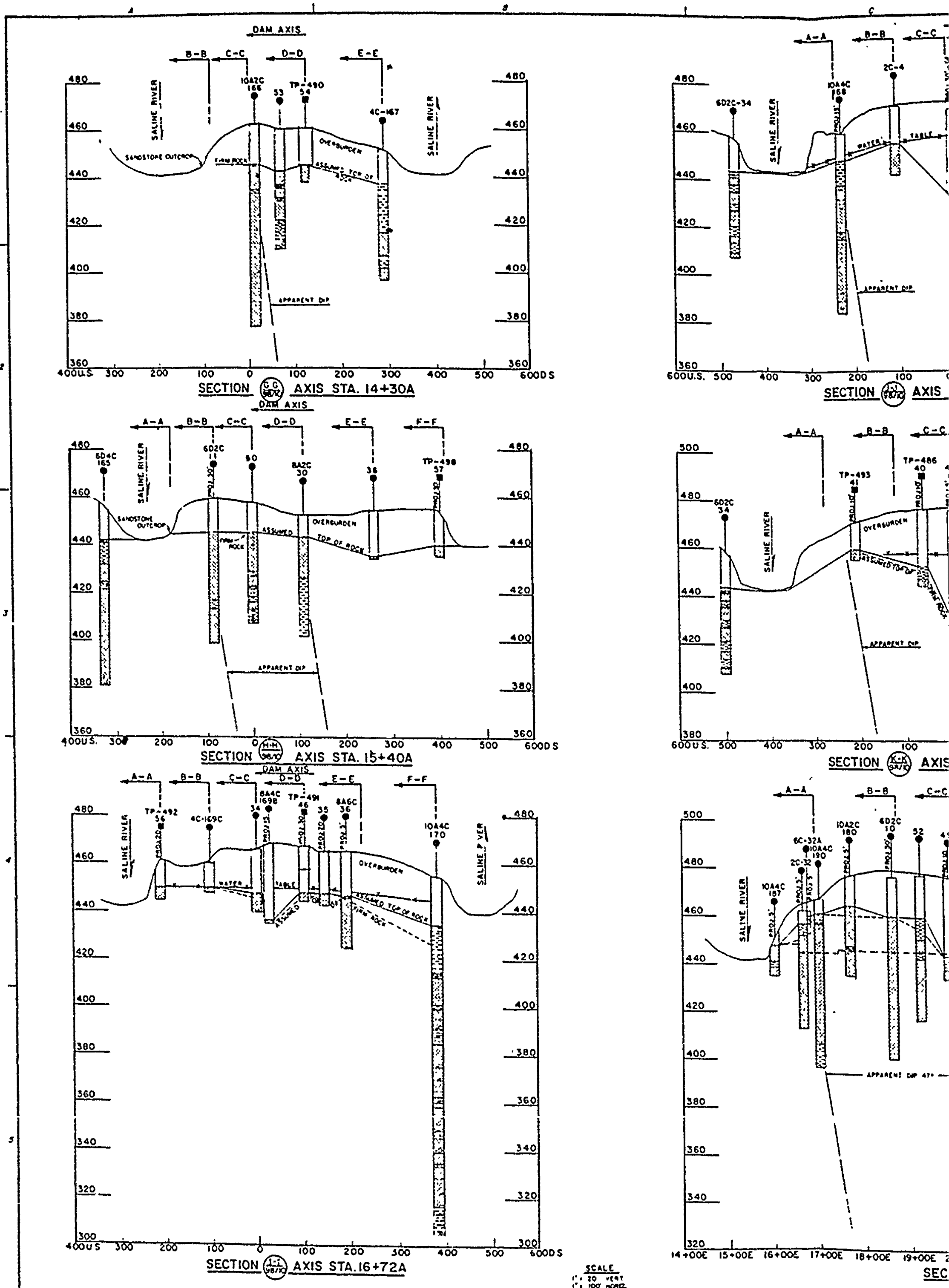
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS ROADS
FOUNDATION EXPLORATION
GEOLOGIC SECTIONS D-D THRU F-F

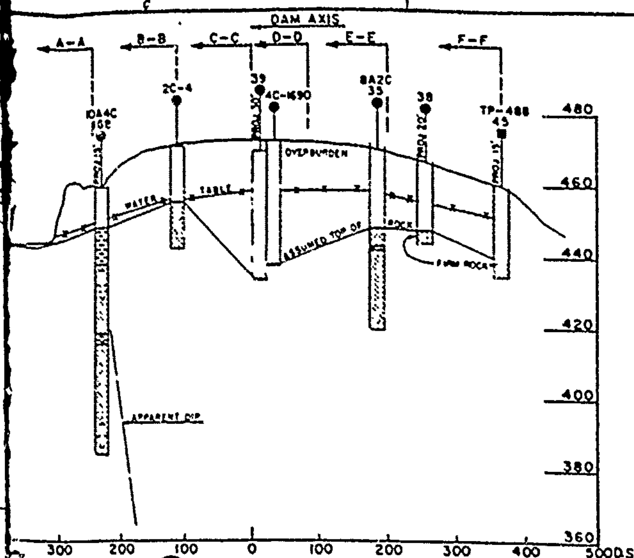
DESIGNED BY: E.n.E.
DRAWN BY:
CHECKED BY: CHIEF ENGR GEOLOGY
SUBMITTED: Brown for CHIEF ENG MATLS BR
DATE DEC 1968

INVITATION NO. DACW 56-70-B-0053
SCALE AS SHOWN
DRAWING NO. 1960-C3-98/12

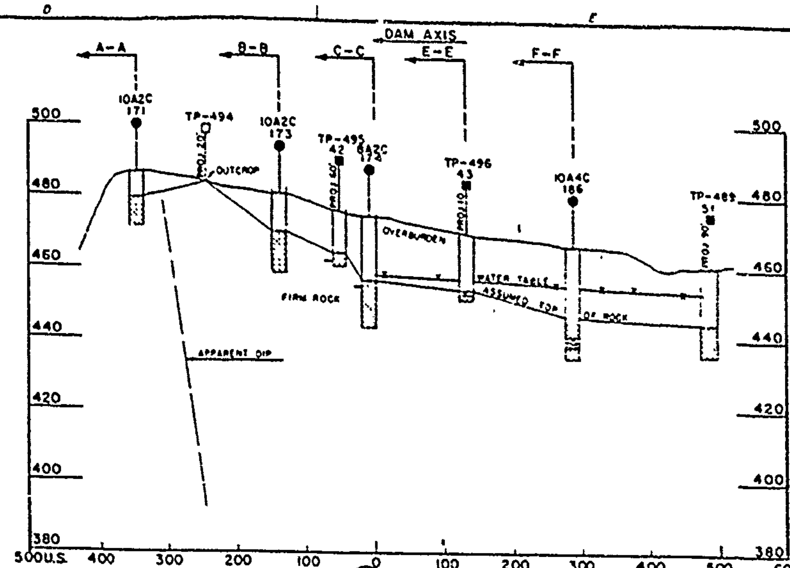


DAM AXIS
SECTION G-G 98/10 AXIS STA. 14+30A
SECTION H-H 98/10 AXIS STA. 15+40A
SECTION I-I 98/10 AXIS STA. 16+72A
SECTION J-J 98/10 AXIS
SECTION K-K 98/10 AXIS
SALINE RIVER
SANDSTONE OUTCROP
FIRM ROCK
OVERBURDEN
ASSUMED TOP OF ROCK
WATER TABLE
APPARENT DIP
APPARENT DIP 47°
400 U.S.
600 D.S.
600 U.S.
14+00E
15+00E
16+00E
17+00E
18+00E
19+00E
SCALE
1" = 20' VERT
1" = 100' HORIZ

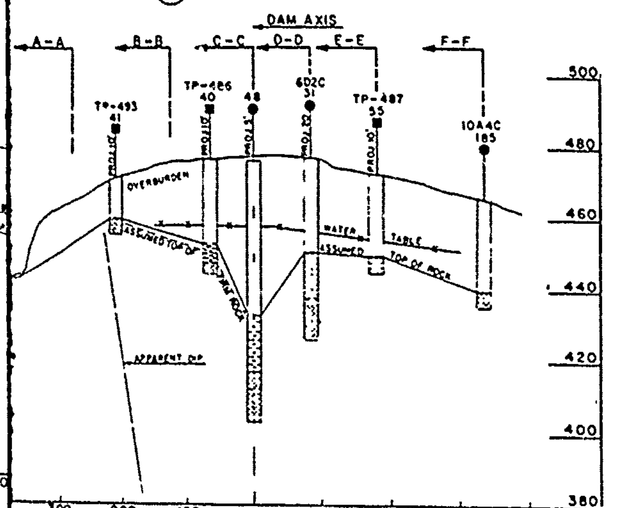
(i)



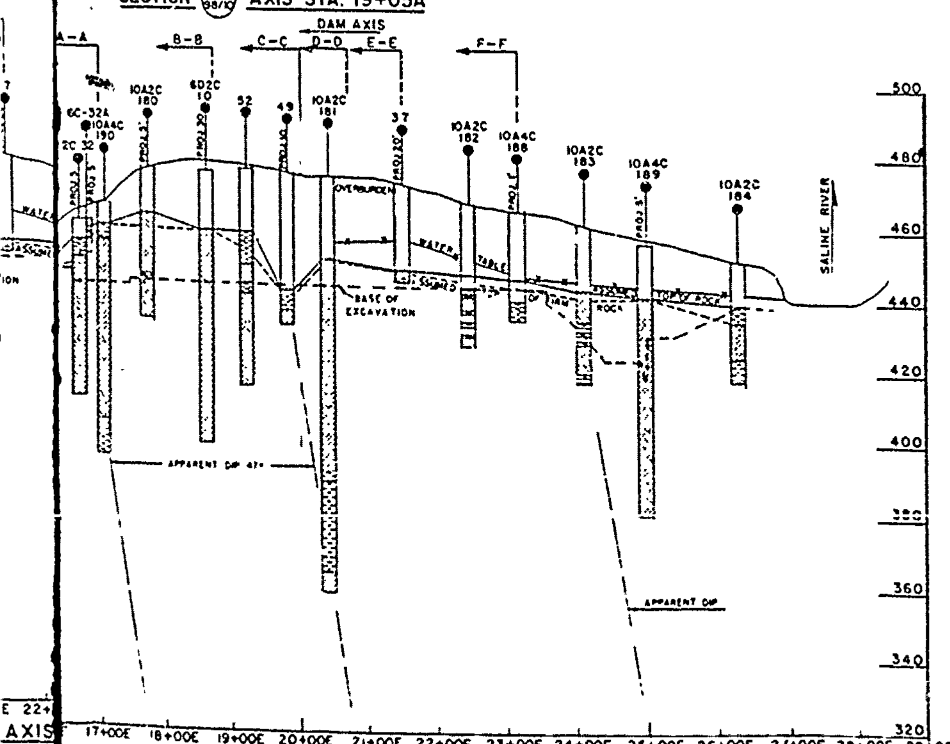
SECTION J-J 98/10 AXIS STA 17+85A



SECTION M-M 98/10 AXIS STA. 21+30A



SECTION K-K 98/10 AXIS STA. 19+05A



SECTION L-L 98/10 AXIS STA. 20+00A
(ON ℄ OUTLET WORKS)

NOTES

1. *Projection of geologic data between boring on this Dwg is presented for the general information of the contractor and is to be considered only as a supplement to the contract drawings. The projection of geologic data between boring is the contracting officers interpretations of the general geologic conditions of the location of the section.*

2. *In holes where no water table is shown, the table was not obtained. Absence of water table elevations on logs does not necessarily mean that ground water will not be encountered at the locations and within the vertical reaches of these borings.*

LEGEND

- OVERBURDEN
- SANDSTONE
- SHALE
- 10A4C 183 — CORE BORING NUMBER 183 PREFIX INDICATES SIZE AND TYPE BORING, Ie C = CORE, A = AUGER D = DENISON
- TP = BACKHOE TEST PIT
- CORE BORING IN TEST PIT

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION INDICATED BY

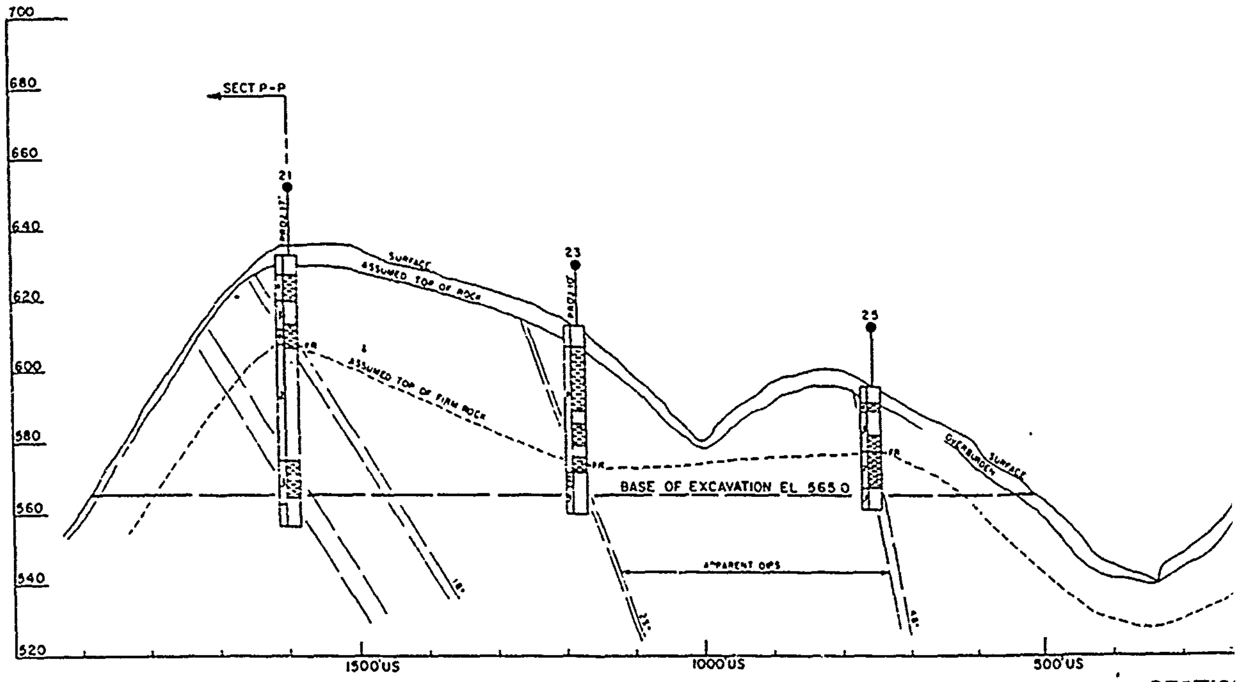
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER ARKANSAS

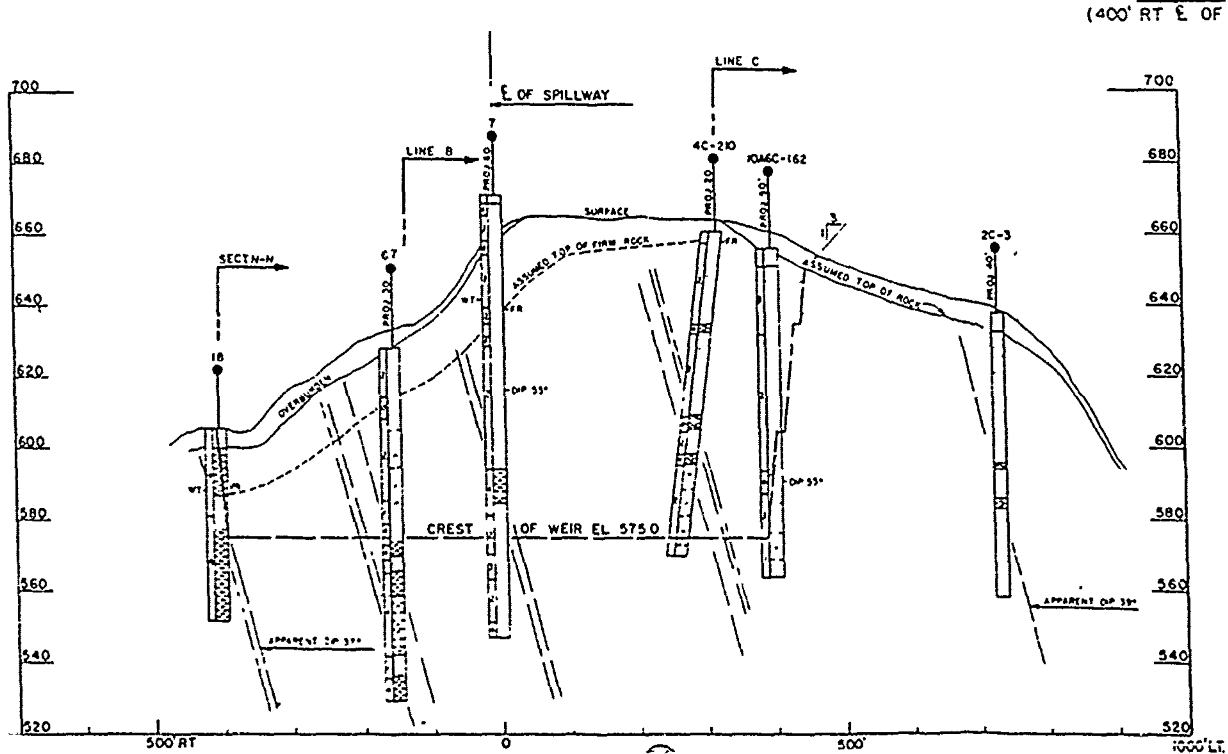
DESIGNED BY
DRAWN BY
CHECKED BY
SUBMITTED

DIERKS DAM
EMB, OUTLET WKS, SPILLWAY & ACCESS ROADS
FOUNDATION EXPLORATION
GEOLOGIC SECTIONS G-G THRU M-M

INVITATION NO. DA CW 56-[illegible]
SCALE AS SHOWN
DEC 1968
DRAWING NO. 1960-C3-98/13



SECTION
(400' RT ℄ OF



SECTION
(AXIS OF WEIR)

LEGEND

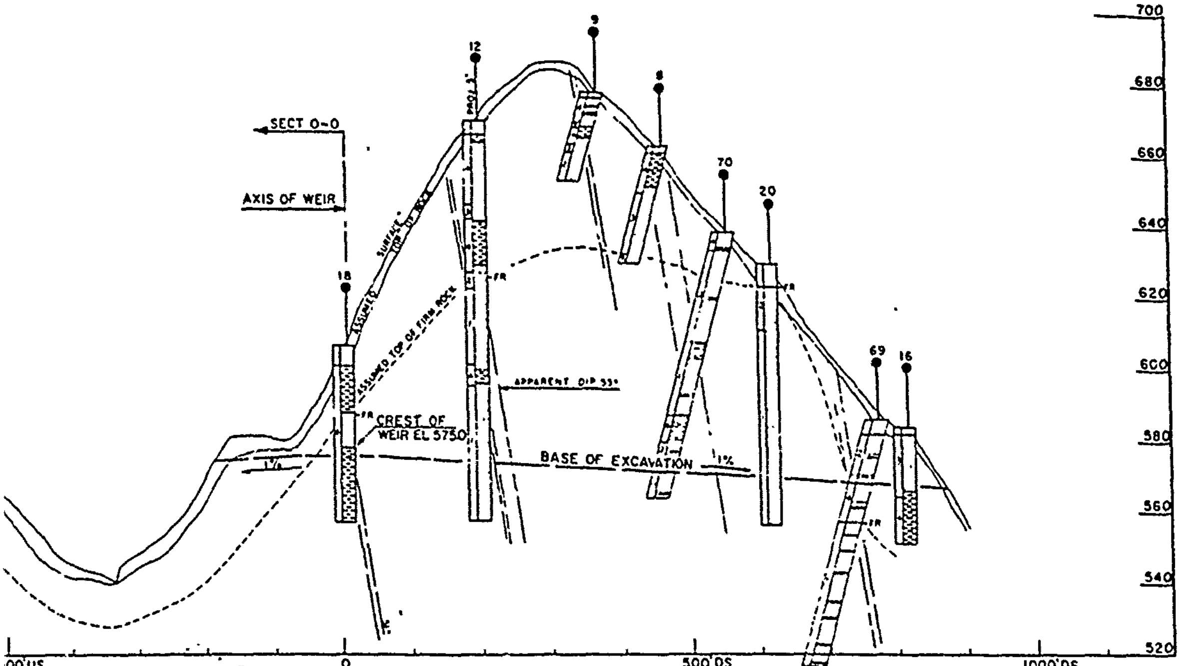
OVERBURDEN

SANDSTONE

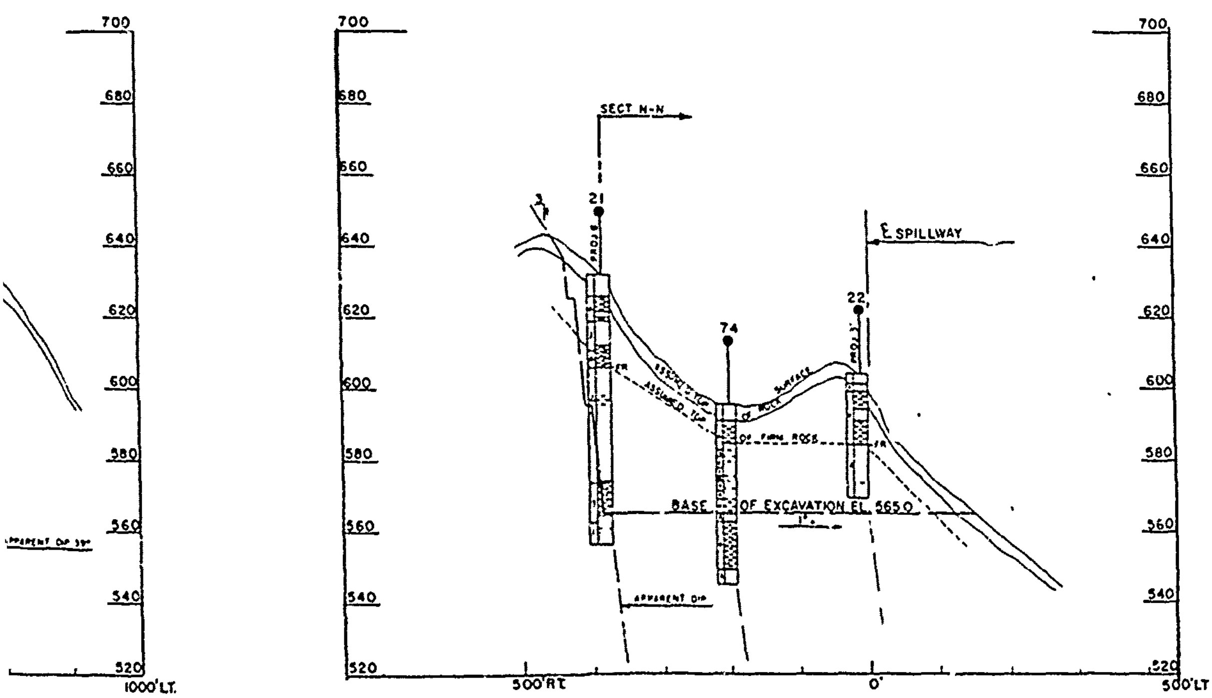
SHALE

CORE BORING NUMBER 183
PREFIX INDICATES SIZE AND
TYPE BORING, C=CORE,
A=AUGER D=DENISON

THIS DRAWING WAS ORIGINALLY PRE
FOR USE AS A CONTRACT DRAWIN
WAS REPRODUCED FOR USE IN THIS P



SECTION N-N 98/10
(400' RT ℄ OF SPILLWAY)



SECTION P-P 98/10

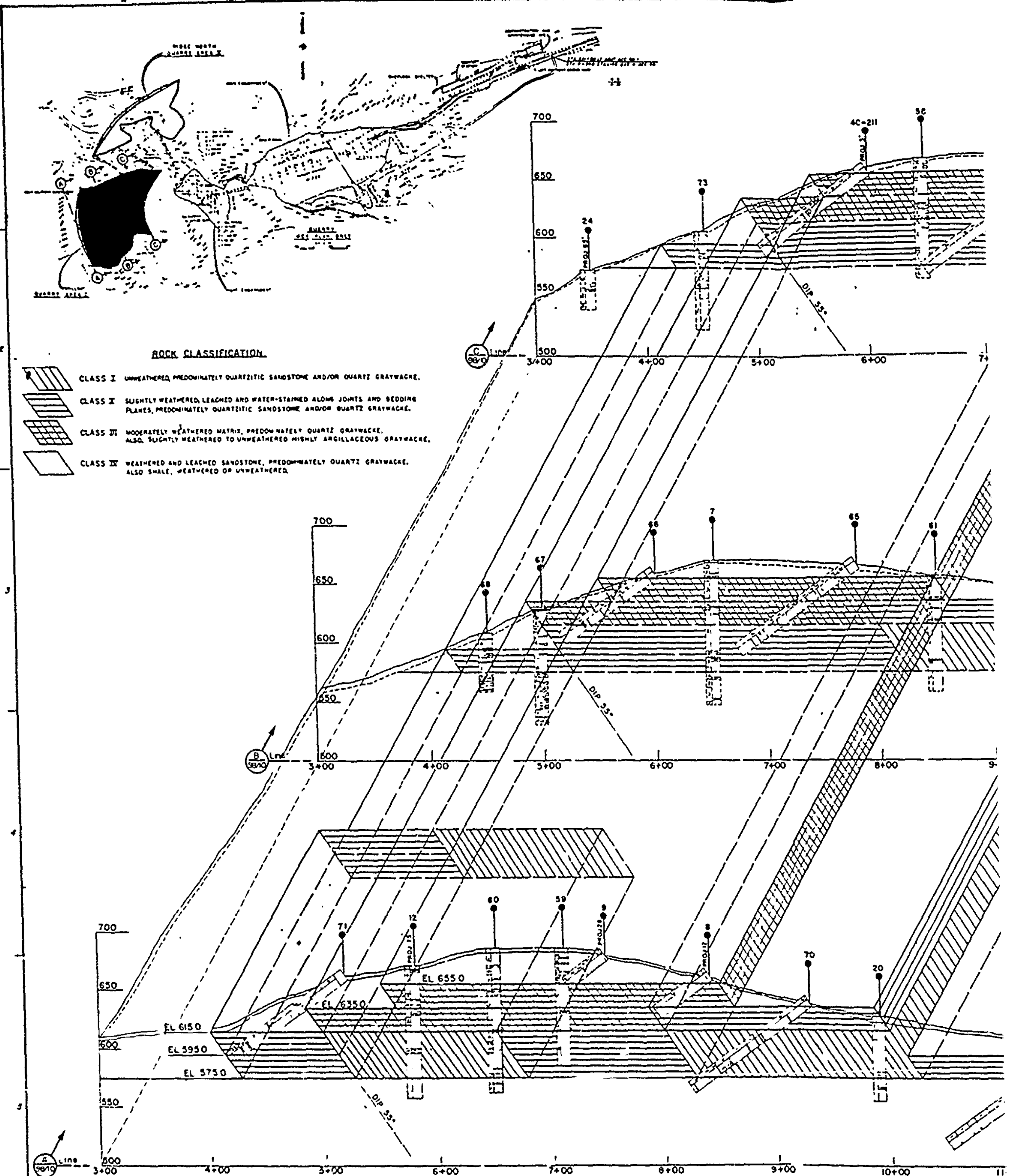
NOTES

1. Projection of geologic data between borings on this Dwg is presented for the general information of the contractor and is to be considered only as a supplement to the contract drawings. The projection of geologic data between boring is the contracting officers interpretations of the general geologic conditions of the location of the section.

2. In holes where no water table is shown, the table was not obtained. Absence of water table elevations on logs does not necessarily mean that ground water will not be encountered at the locations and within the vertical reaches of these borings.

AS ORIGINALLY PREPARED CONTRACT DRAWING AND D FOR USE IN THIS REPORT

U.S. ARMY ENGINEER DISTRICT, TULSA CORPS OF ENGINEERS TULSA, OKLAHOMA	
RED RIVER WATERSHED	SALINE RIVER, ARKANSAS
DIERKS DAM EMB, OUTLET WKS, SPILLWAY & ACCESS ROADS FOUNDATION EXPLORATION GEOLOGIC SECTIONS N-N THRU P-P	
DESIGNED BY	DRAWN BY
CHECKED BY	CHIEF, ENGR GEOLOGY
SUBMITTED	CHIEF, FND MATLS BR
DEC 1968	INVITATION NO. DACW 56-70-B-0083
SCALE AS SHOWN	DRAWING NO 1960-C3-98/14

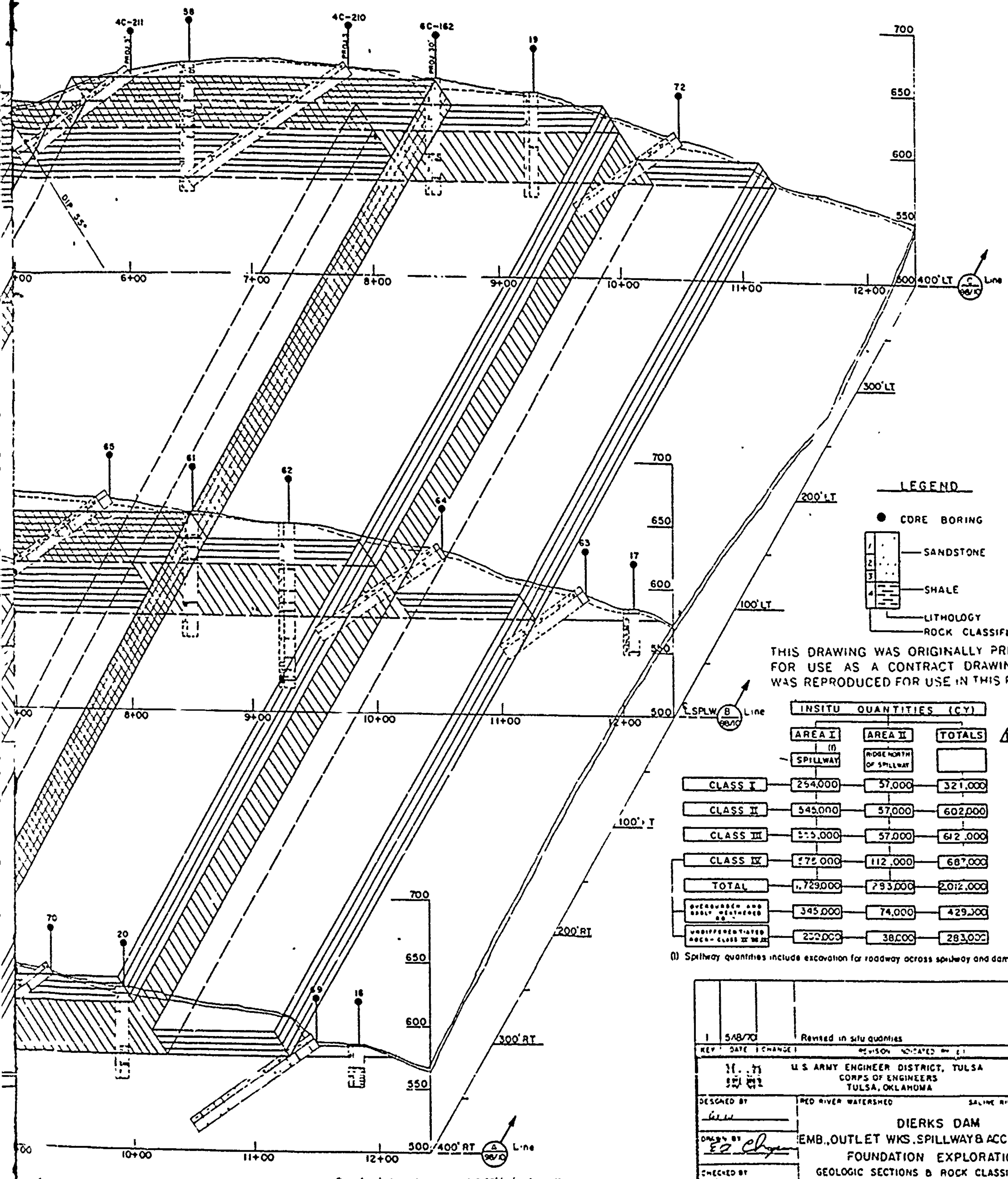


SPILLWAY QUARRY
(SOURCE AREA I)
SCALE 1"=40'

NOTES

1 Projection of geologic data between boring on this Dwg is pr
for the general information of the contractor and is to be cons
as a supplement to the contract drawings. The projection o
data between boring is the contracting officers inte
of the general geologic conditions of the location of the se

①



LEGEND

● CORE BORING

SANDSTONE

SHALE

LITHOLOGY

ROCK CLASSIFICATION

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

INSITU QUANTITIES (CY) ⚠1

	AREA I SPILLWAY (1)	AREA II RIDGE NORTH OF SPILLWAY	TOTALS
CLASS I	254,000	57,000	321,000
CLASS II	545,000	57,000	602,000
CLASS III	[illegible]	57,000	612,000
CLASS IV	[illegible]75,000	112,000	687,000
TOTAL	1,729,000	293,000	2,012,000
OVERBURDEN AND BADLY WEATHERED ROCK	345,000	74,000	429,000
UNDIFFERENTIATED ROCK - CLASS II THRU IV	[illegible]	38,000	283,000

(1) Spillway quantities include excavation for roadway across spillway and dam

...on of geologic data between boring on this Dwg is presented ...general information of the contractor and is to be considered only ...pplement to the contract drawings. The projection of geologic ...etween boring is the contracting officers interpretations ...general geologic conditions of the location of the sections.

2. In holes where no water table is shown, the table was not obtained. Absence of water table elevations on logs does not necessarily mean that ground water will not be encountered at the locations and within the vertical reaches of these borings.

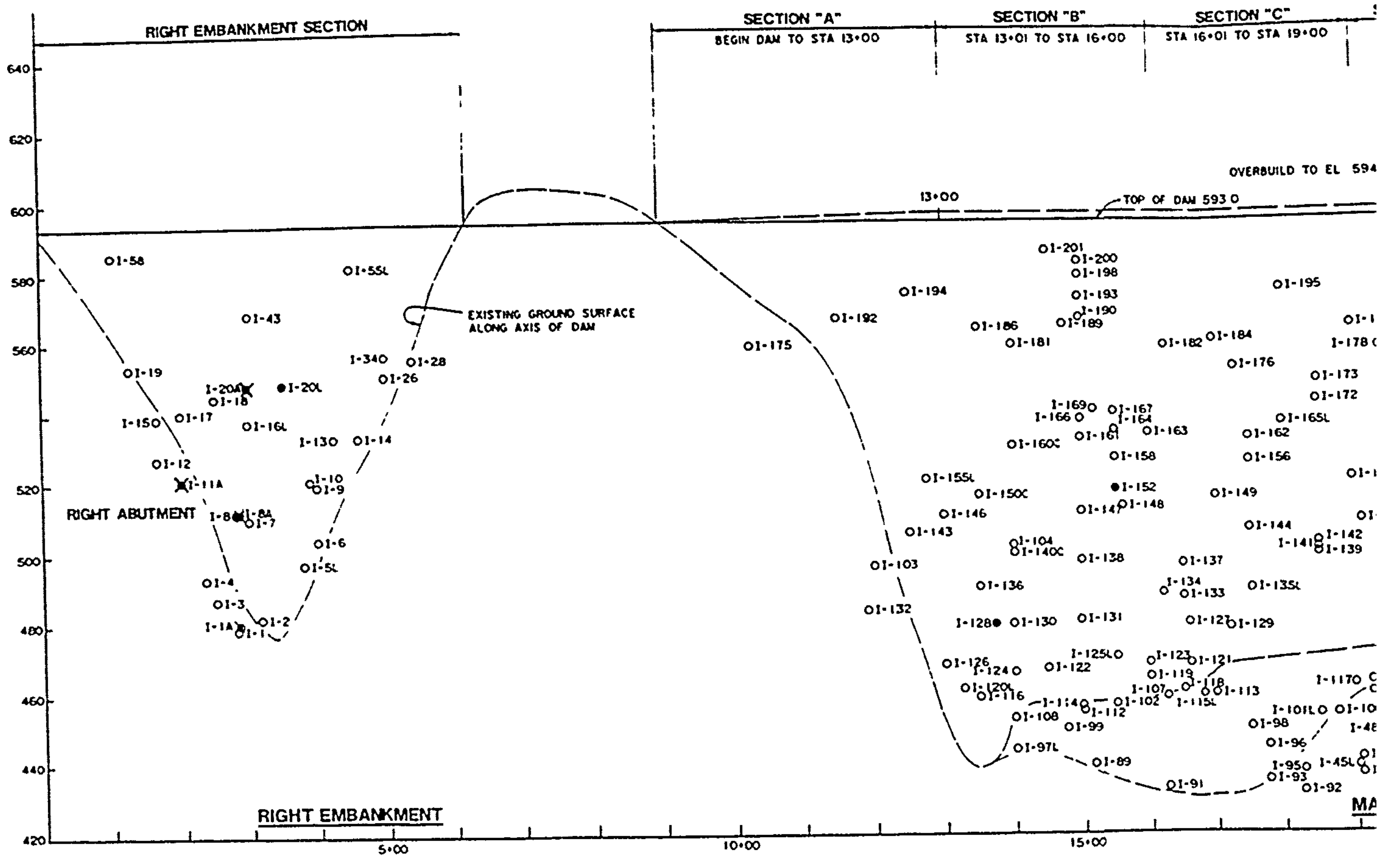
REV	DATE	CHANGE	REVISION INDICATED BY	APPR
1	5/18/70		Revised in situ quantities	

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

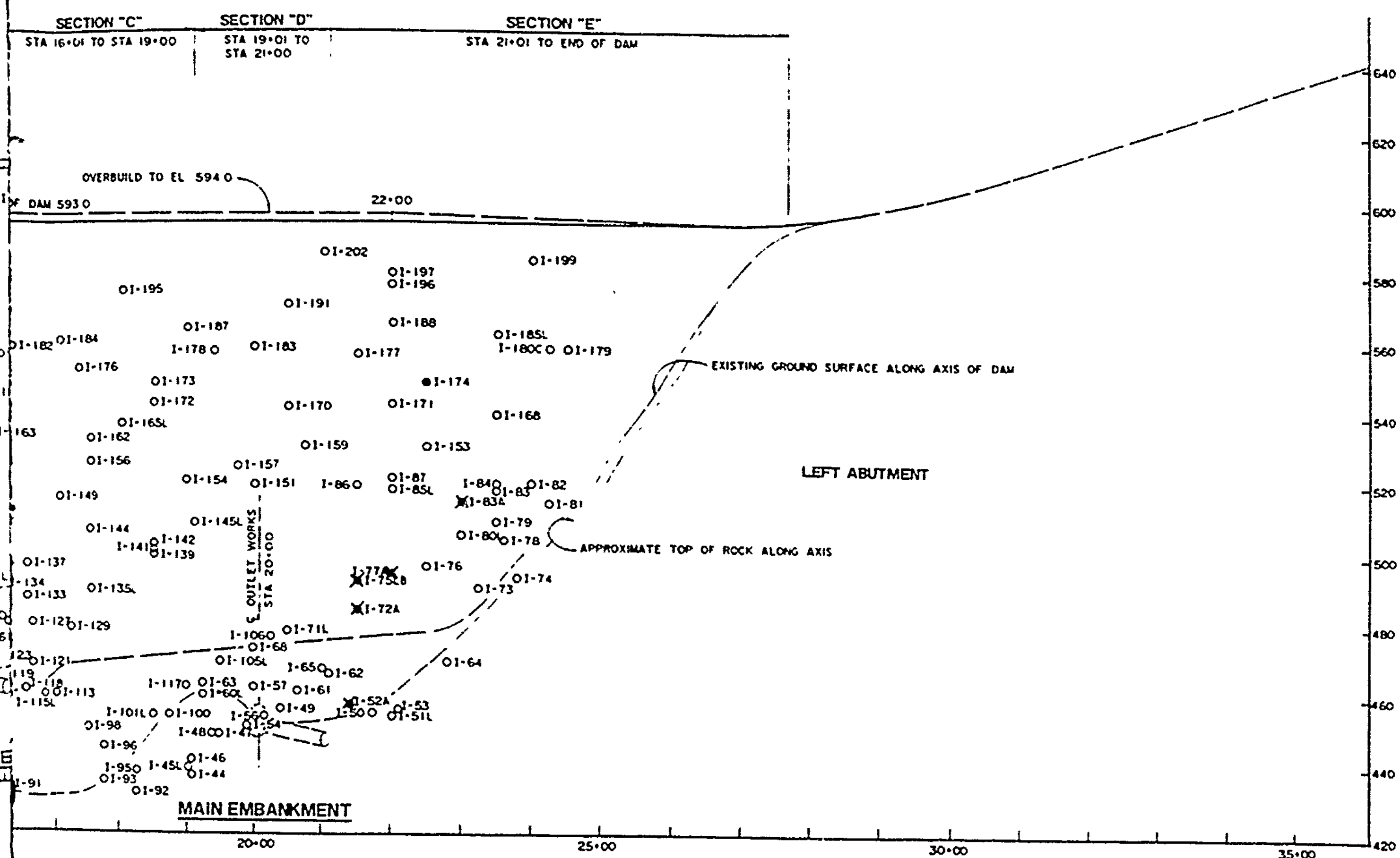
DIERKS DAM
EMB., OUTLET WKS., SPILLWAY & ACCESS ROADS
FOUNDATION EXPLORATION
GEOLOGIC SECTIONS & ROCK CLASSIFICATIONS

DESIGNED BY
DRAWN BY
CHECKED BY
CHIEF, ENGR. SEC.
SUBMITTED
CHIEF, ENG. MATLS BR.
DATE DEC 1968
INVITATION NO. DA-[illegible]
SCALE AS SHOWN
DRAWING NO. 1960-C3-98/151



IMPERVIOUS DENSITY TEST PLOT
PROFILE ALONG DAM AXIS

SCALE 1" = 100' HOR
1" = 20' VERT



ENSITY TEST PLOT
LONG DAM AXIS

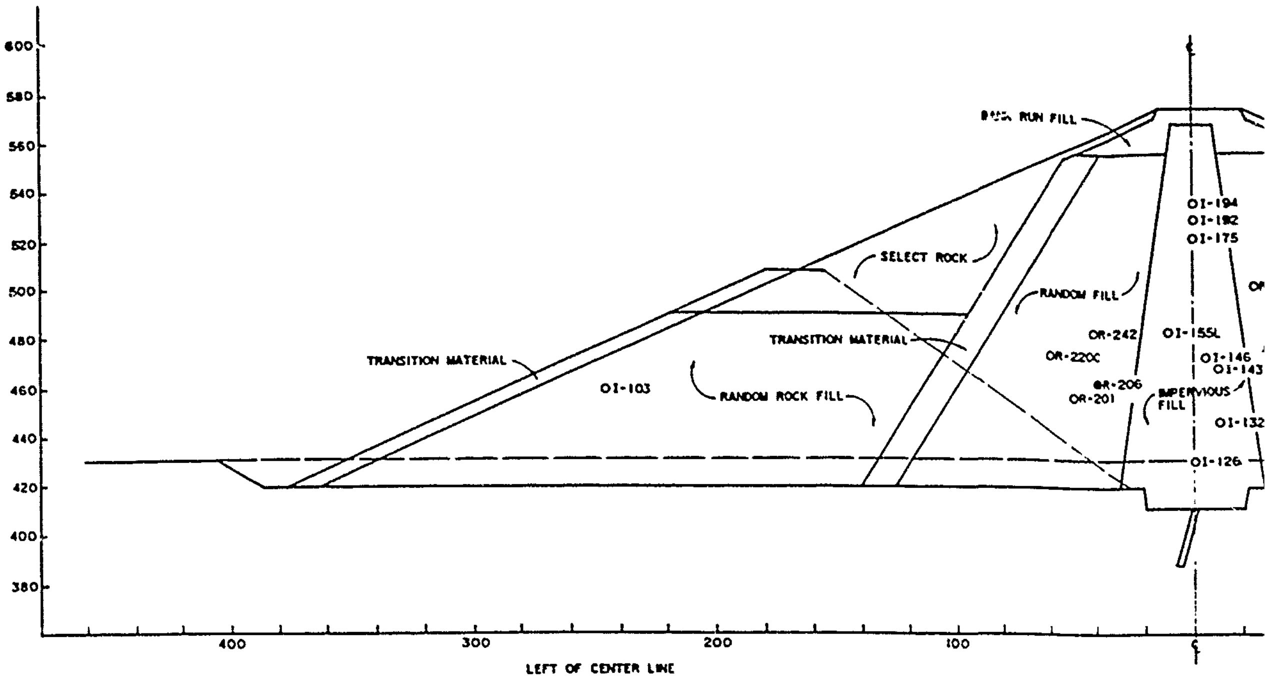
1" = 100' HOR
1" = 20 VERT

NOTES

1. ALL TEST SHOWN HAVE BEEN PROJECTED ONTO THE DAM CENTERLINE
2. TESTS FALLING OUTSIDE LIMITS SHOWN FOR THE TOP OF ROCK INDICATE AREAS OF DEEPER CORE TRENCH EXCAVATION OR VARIATION IN EMBANKMENT WIDTH FROM CENTER LINE PROFILE

LEGEND
O DENSITY TEST PASSED
● DENSITY TEST FAILED
Ж DENSITY TEST RECHECK PASSED

IMPERVIOUS DENSITY
TEST PLOT PROFILE
ALONG DAM AXIS

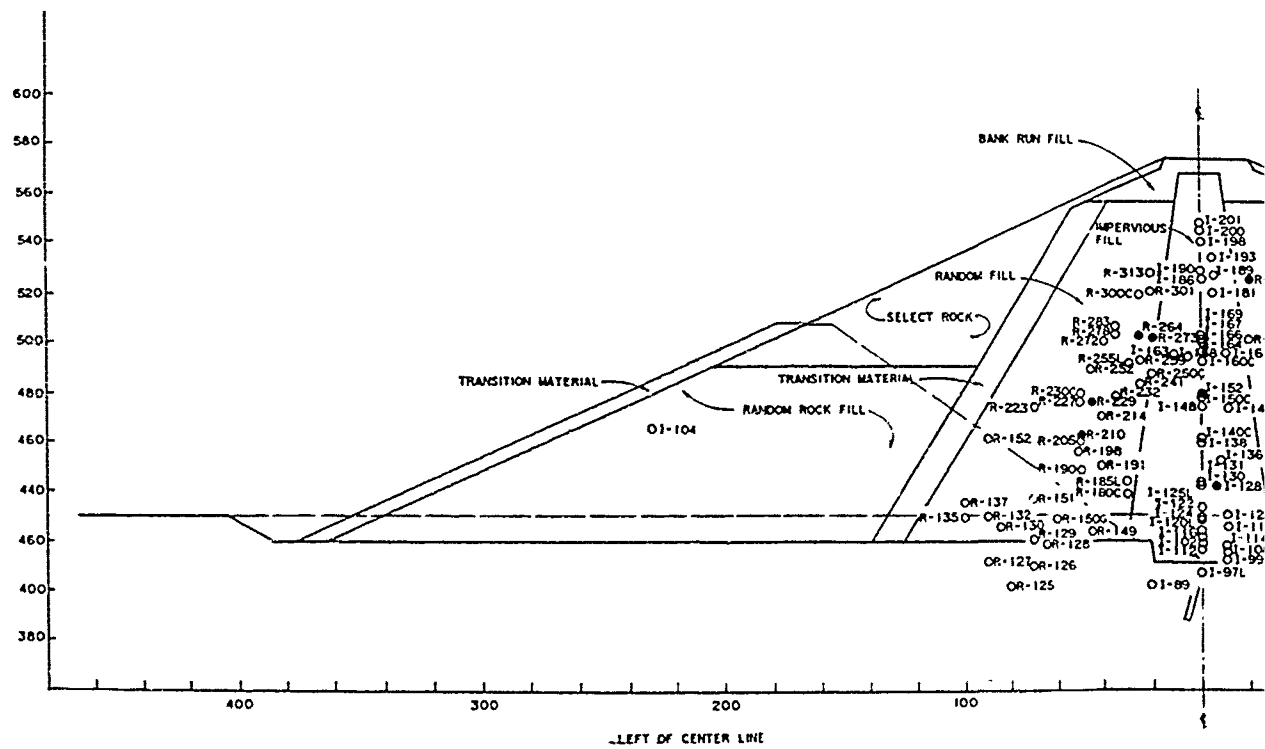


DENSITY TEST PI

SECTION "A" - BEGIN DAM T

SCALE: 1" = 30'

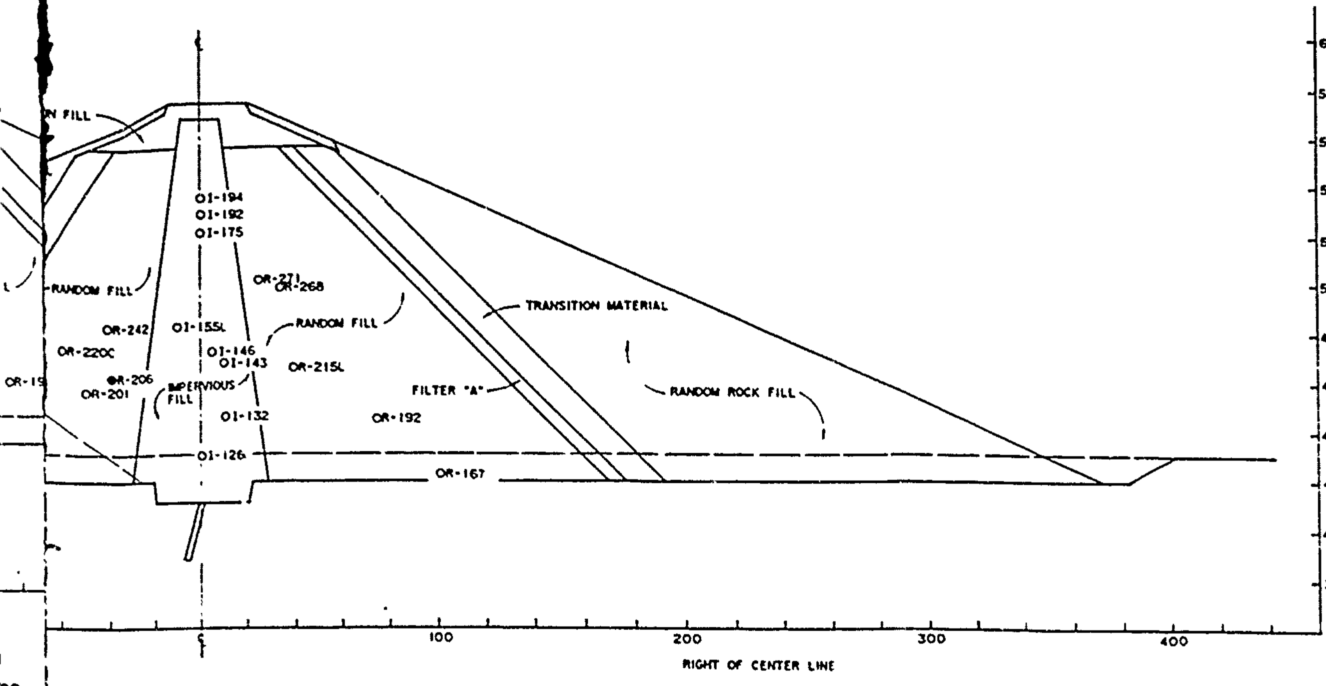
30 0 30'



DENSITY TEST P

SECTION "B" - STA 13+01

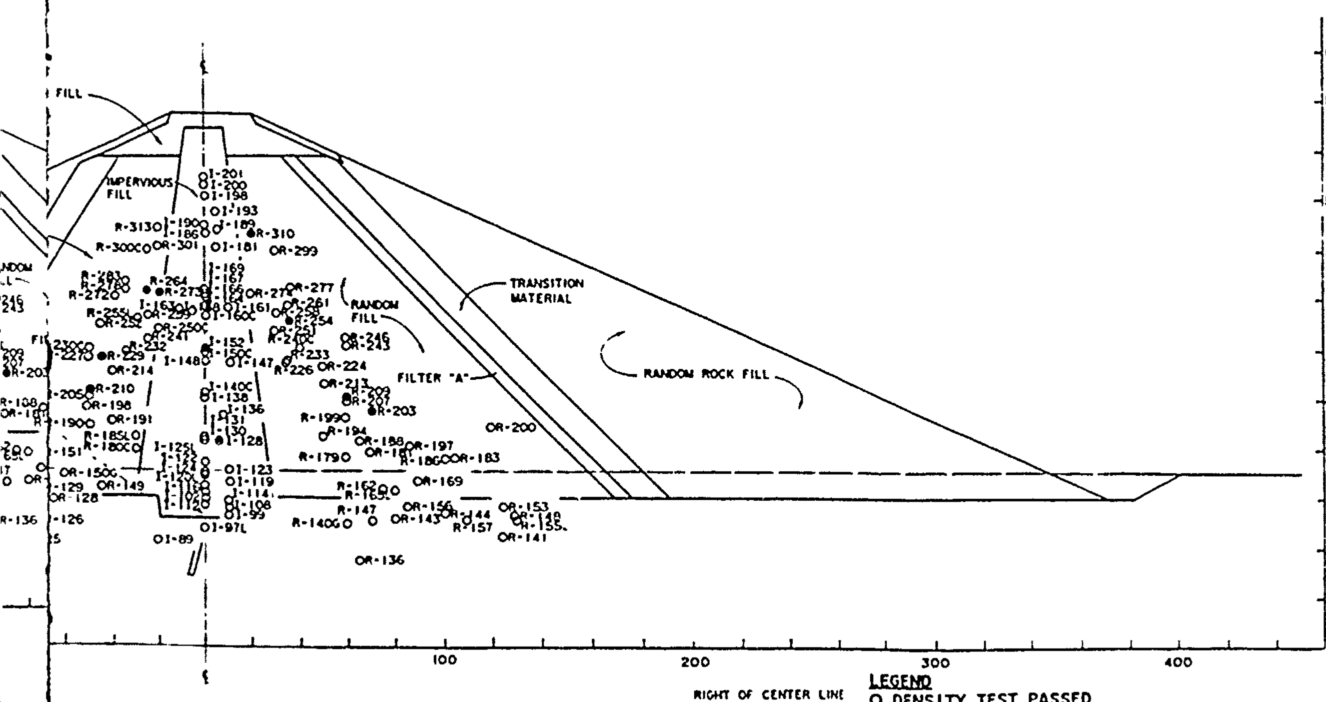
30 0 30



DENSITY TEST PLOT
TION "A" - BEGIN DAM TO STA 13+00

SCALE 1" = 30'

30 0 30' 60' 90



DENSITY TEST PLOT
CTION "B" - STA 13+01 TO STA 16+00

SCALE 1" = 30

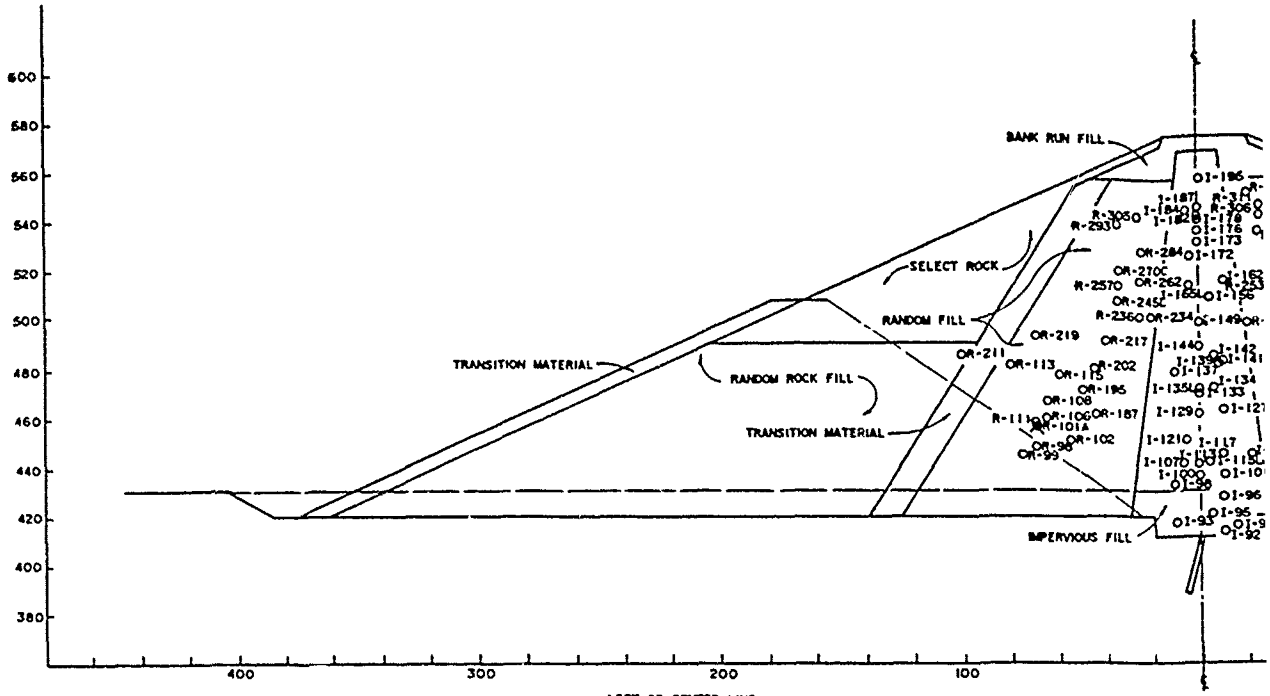
30 0 30 60 90

LEGEND
- O DENSITY TEST PASSED
- ● DENSITY TEST FAILED
- DENSITY TEST RECHECK PASSED

NOTE

1 TESTS OCCURRING BETWEEN THE INDICATED STATIONS ARE SHOWN PLOTTED ON A TYPICAL SECTION

DENSITY TEST PLOT
TYPICAL EMBANKMENT SECTIONS
"A" AND "B"

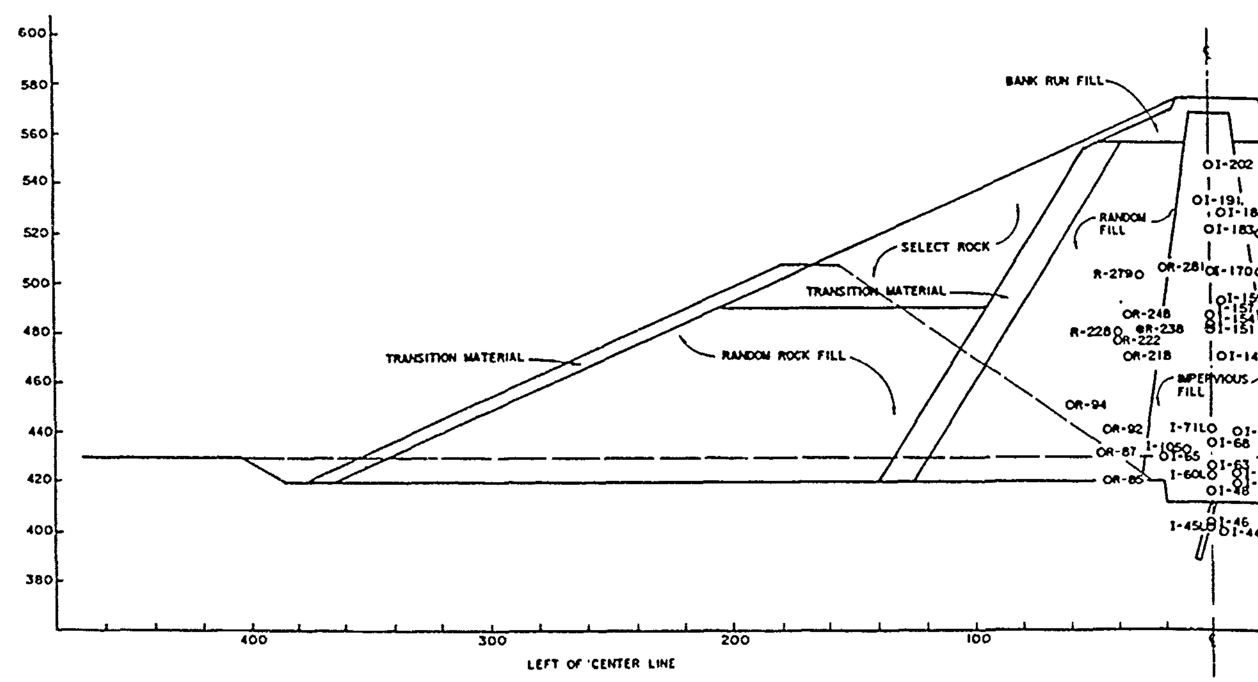


DENSITY TEST PL

SECTION "C" - STA 16+01 T

SCALE. 1" = 30'

30' 0 30'

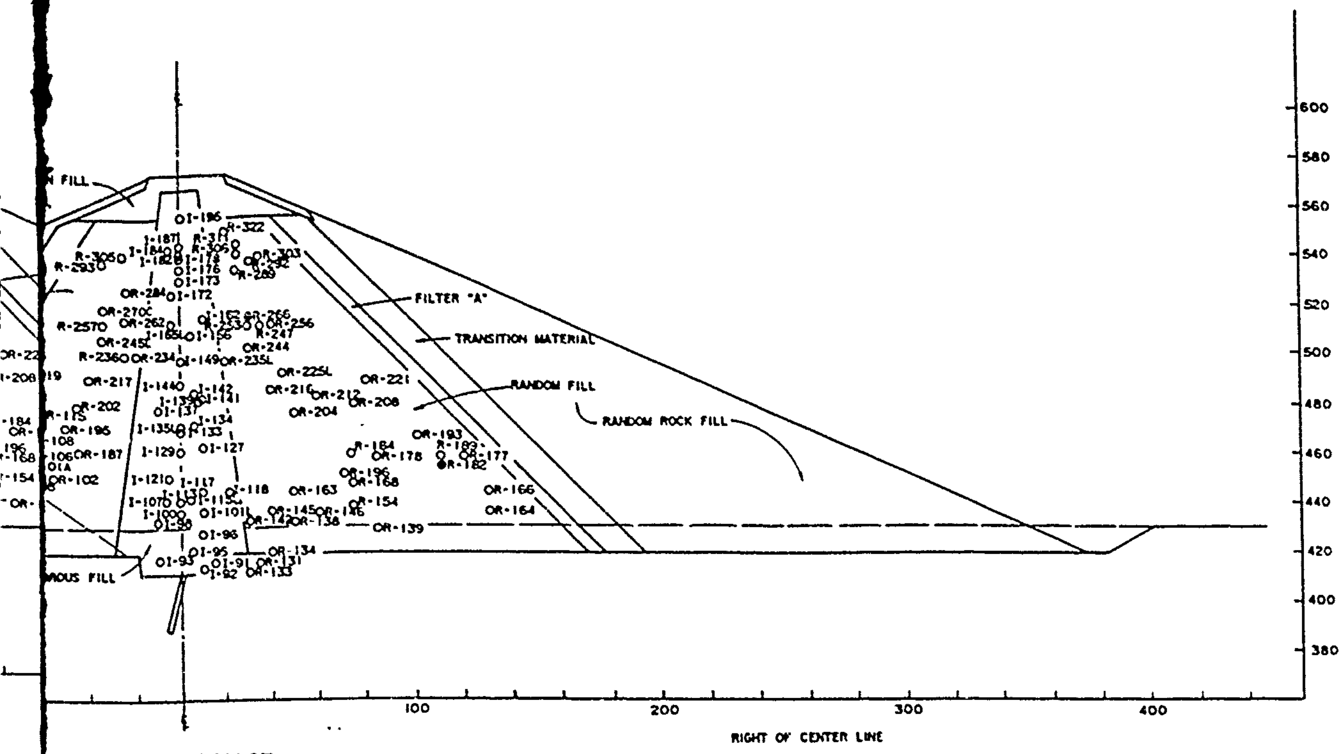


DENSITY TEST P

SECTION "D" - STA 19+01

30' 0 30

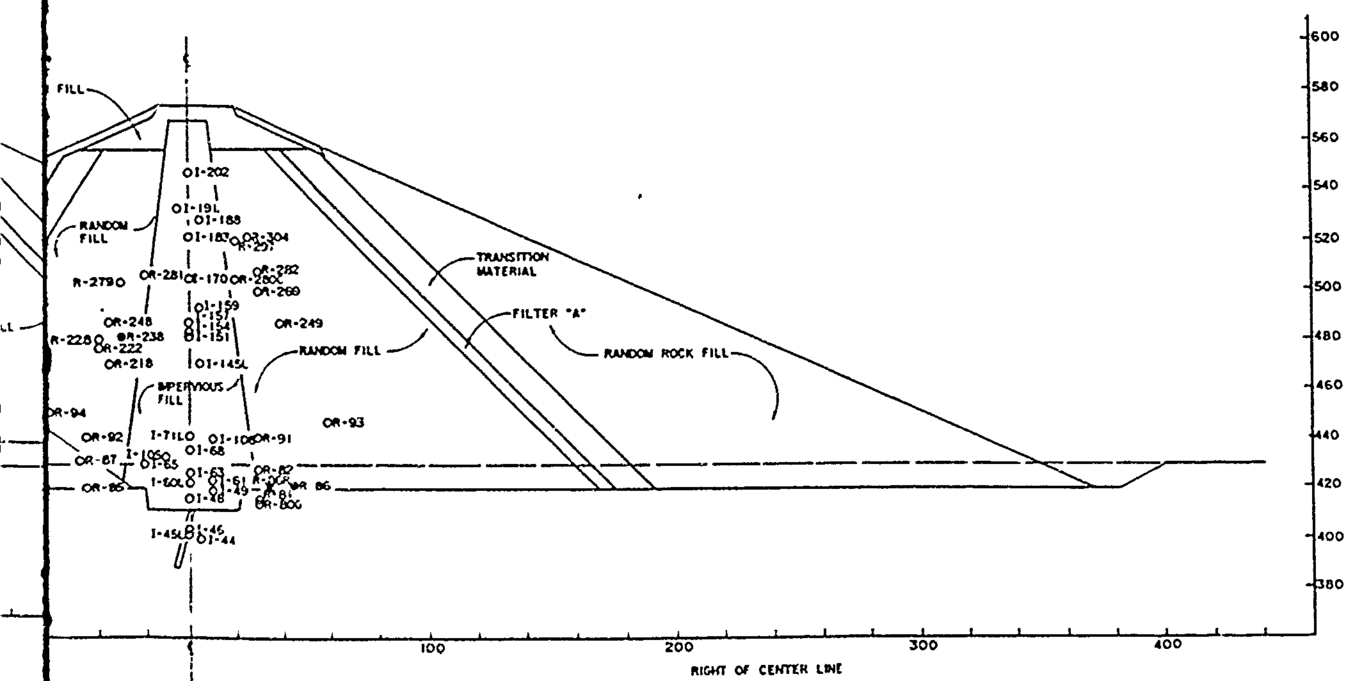
(1)



DENSITY TEST PLOT
ON "C" - STA 16+01 TO STA 19+00

SCALE. 1" = 30'

0 30' 60' 90



DENSITY TEST PLOT
TION "D" - STA 19+01 TO STA 21+00

SCALE 1" = 30

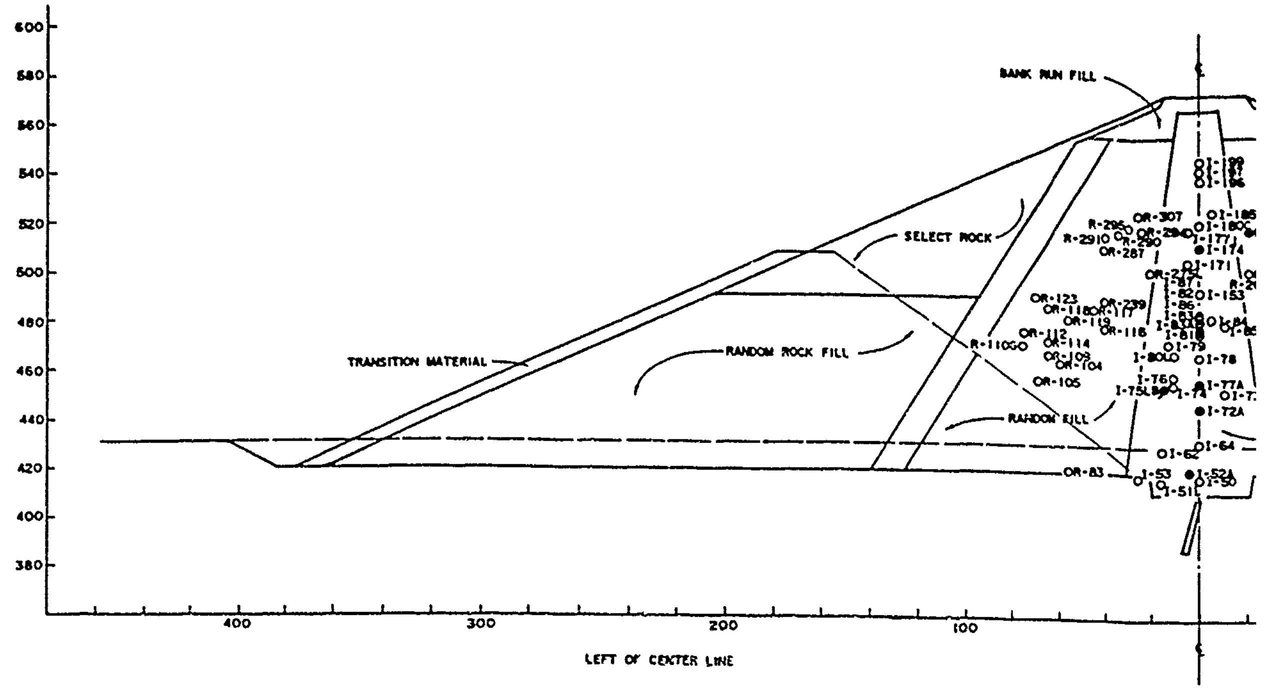
30 0 30 60 90

NOTE

1 TESTS OCCURRING BETWEEN THE INDICATED STATIONS ARE SHOWN PLOTTED ON A TYPICAL SECTION

LEGEND
○ DENSITY TEST PASSED
● DENSITY TEST FAILED
✕ DENSITY TEST RECHECK PASSED

DENSITY TEST PLOT
TYPICAL EMBANKMENT SECTIONS
"C" AND "D"

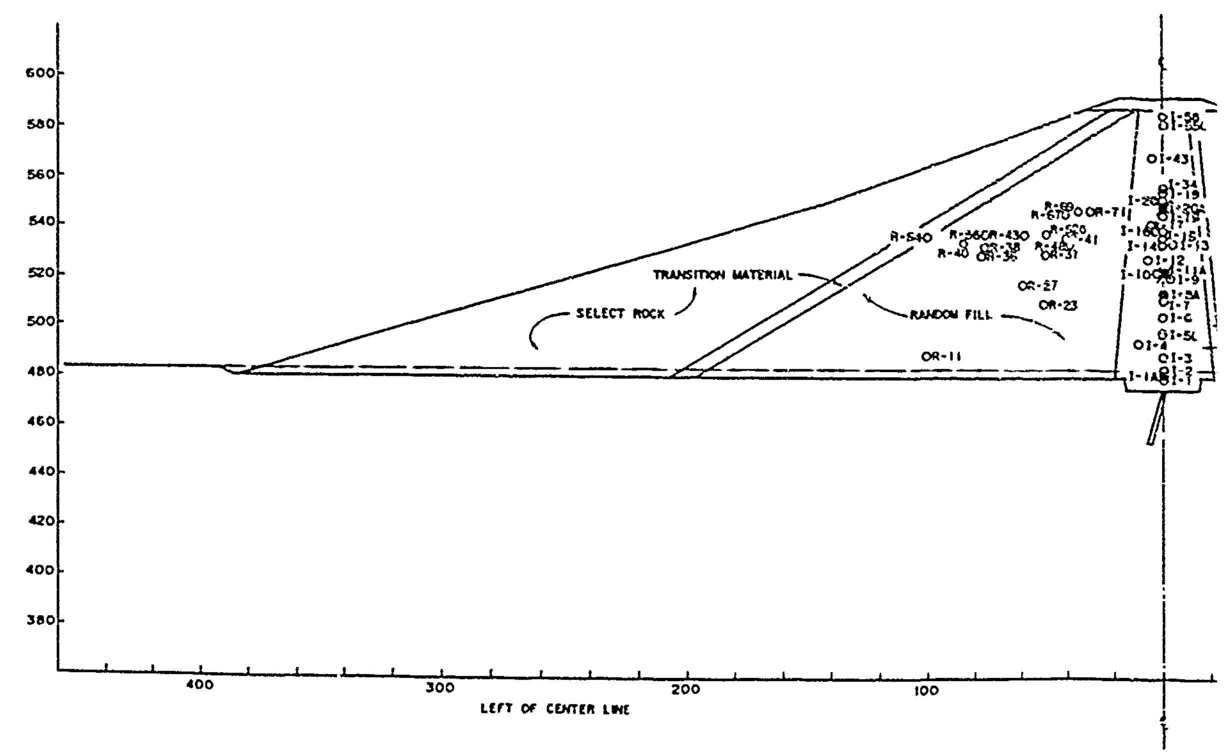


DENSITY TEST I

SECTION "E" - STA 21+01 T

SCALE - 1" = 30'

30' 0 30'

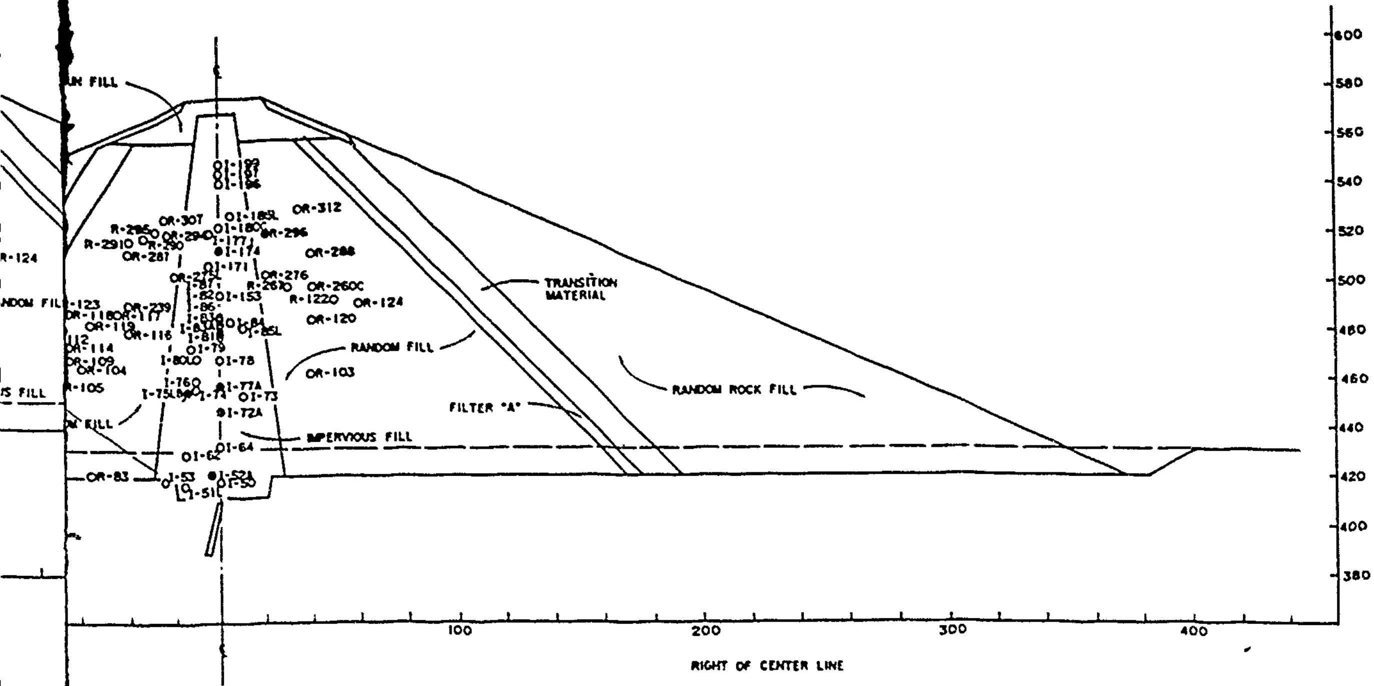


DENSITY TEST

RIGHT EMBANKMENT

SCALE - 1" = 30'

30' 0 30'



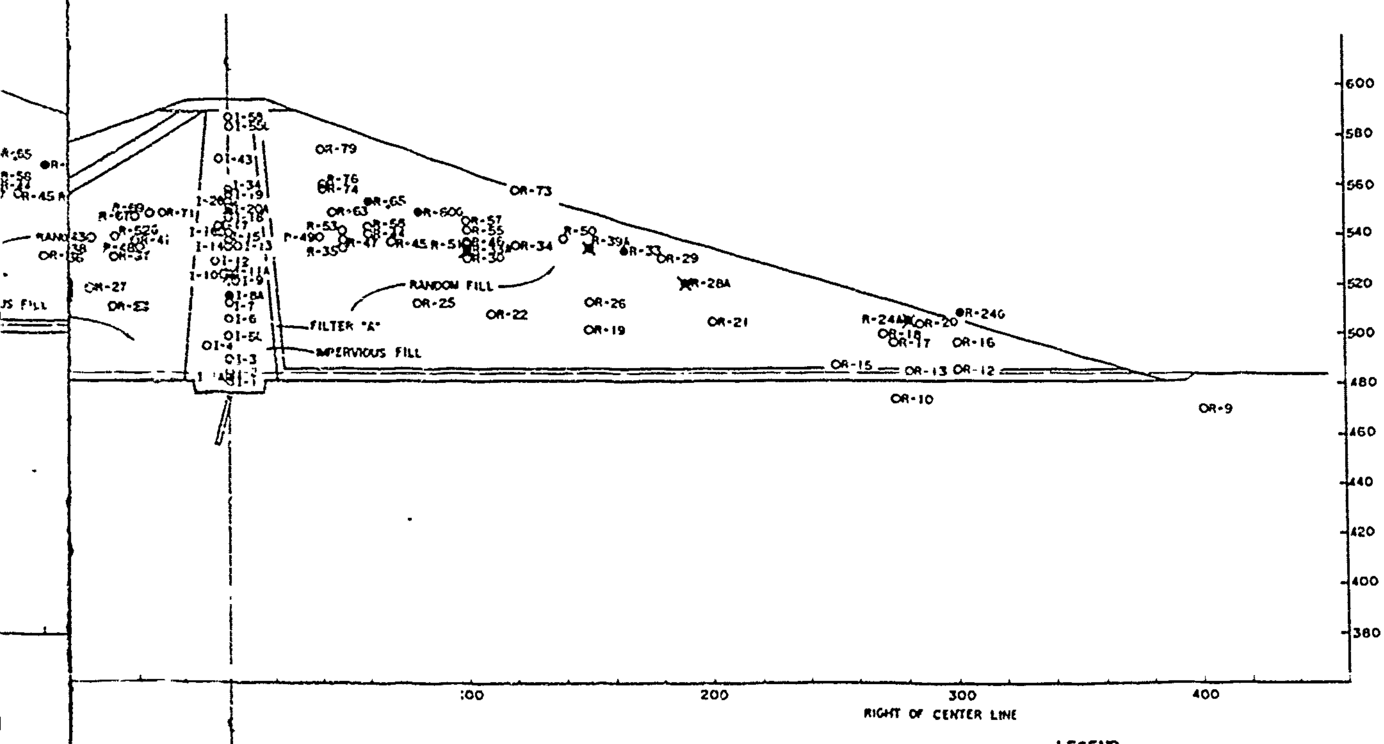
DAM

DENSITY TEST PLOT

TION "E" - STA 21+01 TO END OF DAM

SCALE 1" = 30'

30' 0 30' 60' 90'



DENSITY TEST PLOT

RIGHT EMBANKMENT SECTION

SCALE 1" = 30'

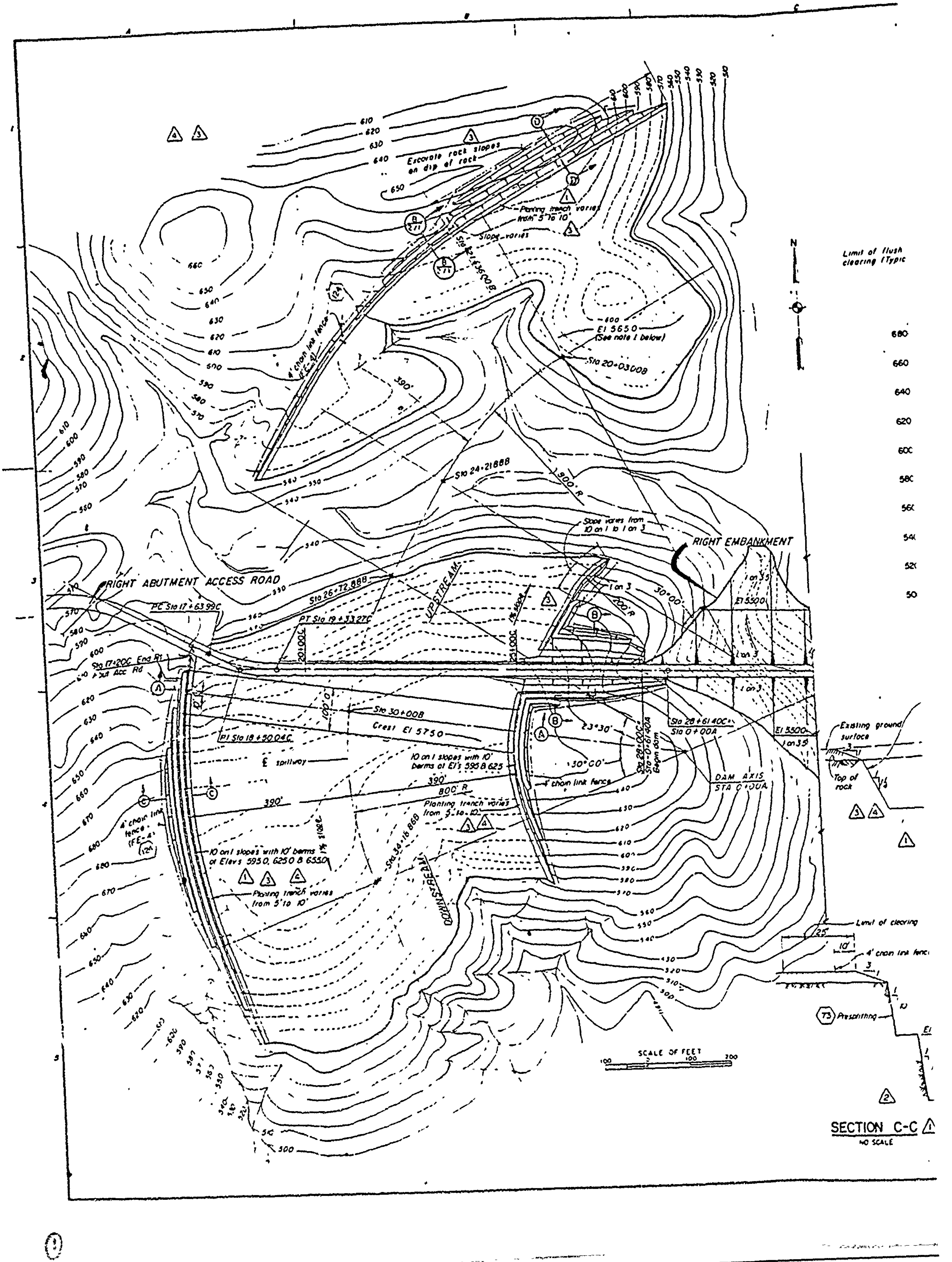
30 0 30' 60' 90

LEGEND
- O DENSITY TEST PASSED
- ● DENSITY TEST FAILED
- ✕ DENSITY TEST RECHECK PASSED

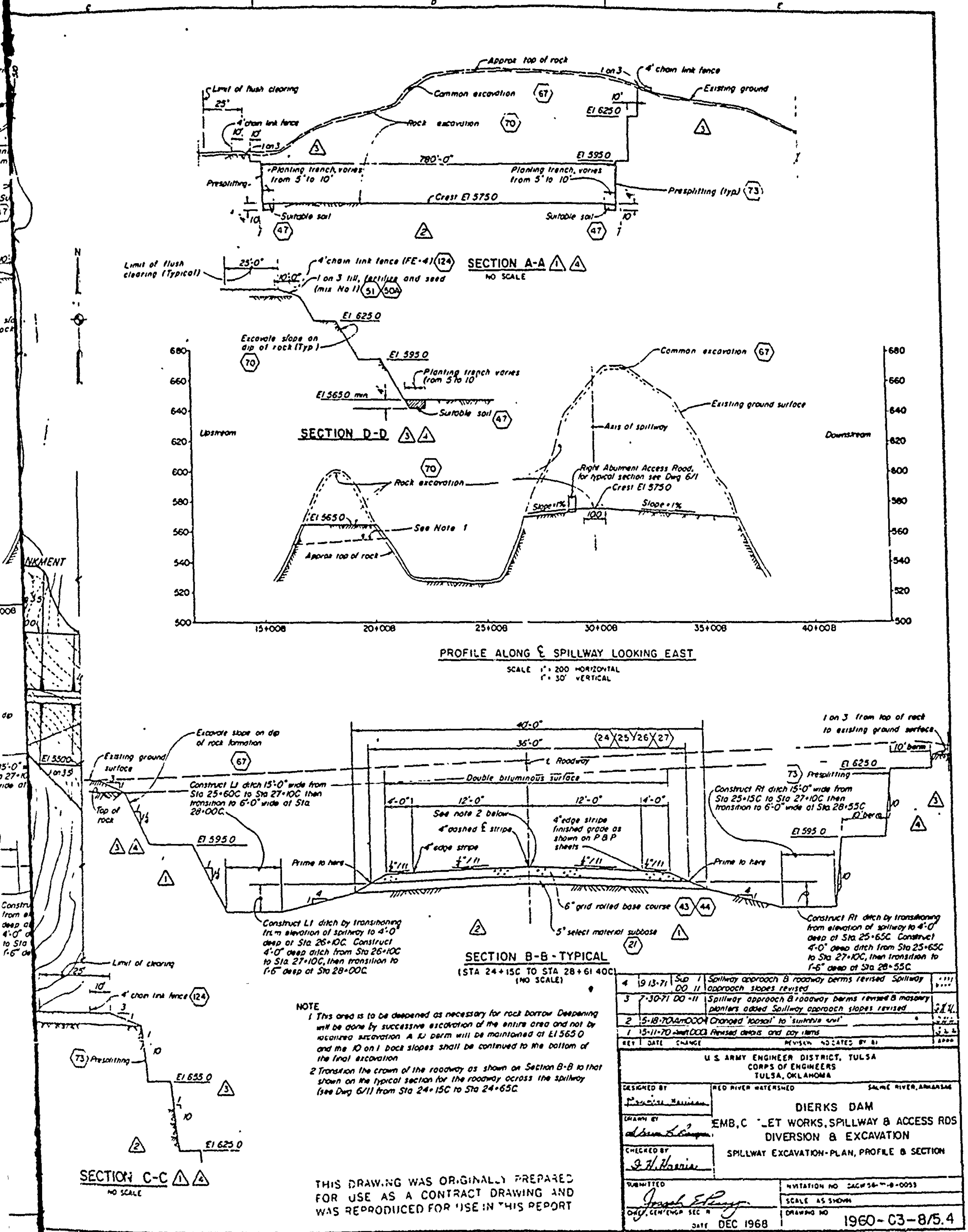
NOTE

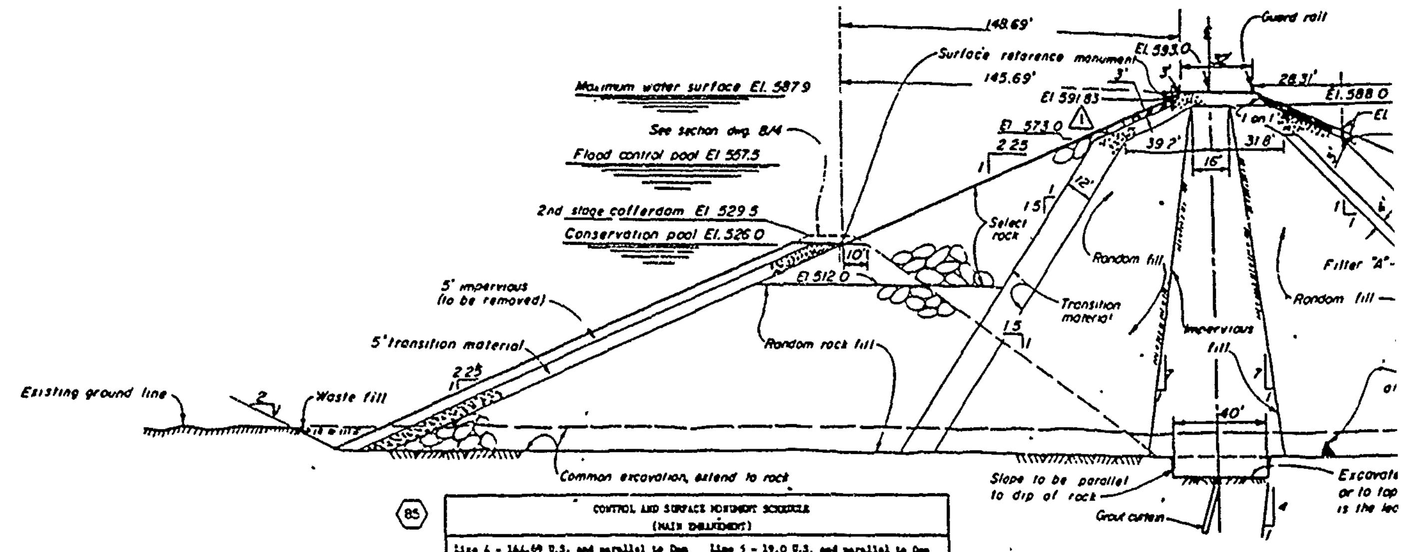
1 TESTS OCCURRING BETWEEN THE INDICATED STATIONS ARE SHOWN PLOTTED ON A TYPICAL SECTION

DENSITY TEST PLOT
TYPICAL EMBANKMENT SECTION "E"
AND
RIGHT EMBANKMENT SECTION



Excavate rock slopes on dip of rock
Planting trench varies from 5' to 10'
Slope varies
4' chain link fence (FE-4)
El 5650 (See note 1 below)
Sta 20+03.00B
Sta 24+21.88B
1900' R
Slope varies from 10 on 1 to 1 on 3
RIGHT EMBANKMENT
RIGHT ABUTMENT ACCESS ROAD
PC Sta 17+63.99C
PT Sta 19+33.27C
Sta 26+72.88B
UPSTREAM
Sta 17+20C End Rt Abut Acc Rd
Sta 30+00B
Crest El 5750
PI Sta 18+50.04C
Spillway
10 on 1 slopes with 10' berms at El's 5958 625
Planting trench varies from 5' to 10'
10 on 1 slopes with 10' berms at Elevs 5950, 6250 & 6550
Planting trench varies from 5' to 10'
DOWNSTREAM
Sta 34+16.86B
Sta 28+61.40C
Sta 0+00A
DAM AXIS
STA 0+00A
SCALE OF FEET
Limit of flush clearing (Typic
Existing ground surface
Top of rock
Limit of clearing
4' chain link fenc
Presplitting
SECTION C-C
NO SCALE


SECTION A-A
NO SCALE
Approx top of rock
Common excavation
Rock excavation
Existing ground
Limit of flush clearing
4' chain link fence
Planting trench varies from 5' to 10'
Presplitting
Presplitting (typ)
Crest El 575.0
Suitable soil
780'-0"
El 625.0
El 595.0
SECTION D-D
Limit of flush clearing (Typical)
4' chain link fence (FE-4)
1 on 3 fill, fertilize and seed (mix No 1)
Excavate slope on dip of rock (Typ)
El 565.0 min
PROFILE ALONG ℄ SPILLWAY LOOKING EAST
SCALE 1" = 200 HORIZONTAL
1" = 30' VERTICAL
Upstream
Downstream
Axis of spillway
Existing ground surface
Right Abutment Access Road, for typical section see Dwg 6/1
Crest El 575.0
Slope = 1%
See Note 1
Approx top of rock
SECTION B-B - TYPICAL
(STA 24+15C TO STA 28+61.40C)
(NO SCALE)
Excavate slope on dip of rock formation
Existing ground surface
Top of rock
Double bituminous surface
℄ Roadway
Construct Lt ditch 15'-0" wide from Sta 25+60C to Sta 27+10C then transition to 6'-0" wide at Sta 28+00C
Construct Rt ditch 15'-0" wide from Sta 25+15C to Sta 27+10C then transition to 6'-0" wide at Sta 28+55C
Construct Lt ditch by transitioning from elevation of spillway to 4'-0" deep at Sta 26+10C. Construct 4'-0" deep ditch from Sta 26+10C to Sta 27+10C, then transition to 1'-6" deep at Sta 28+00C
Construct Rt ditch by transitioning from elevation of spillway to 4'-0" deep at Sta 25+65C. Construct 4'-0" deep ditch from Sta 25+65C to Sta 27+10C, then transition to 1'-6" deep at Sta 28+55C
6" grid rolled base course
5" select material subbase
1 on 3 from top of rock to existing ground surface
SECTION C-C
NO SCALE
Limit of clearing
4' chain link fence
Presplitting
El 655.0
El 625.0
NOTE
1 This area is to be deepened as necessary for rock borrow. Deepening will be done by successive excavation of the entire area and not by localized excavation. A 10' berm will be maintained at El 565.0 and the 10 on 1 back slopes shall be continued to the bottom of the final excavation.
2 Transition the crown of the roadway as shown on Section B-B to that shown on the typical section for the roadway across the spillway (see Dwg 6/1) from Sta 24+15C to Sta 24+65C.
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA
RED RIVER WATERSHED
SALINE RIVER, ARKANSAS
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
DIVERSION & EXCAVATION
SPILLWAY EXCAVATION - PLAN, PROFILE & SECTION
DATE DEC 1968
SCALE AS SHOWN
1960-C3-8/5.4
THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT



MAIN EMBANKMENT

(TYPICAL SECTION)

SCALE: 1" = 30'

CONTROL AND SURFACE MONUMENT SCHEDULE (MAIN EMBANKMENT)

Line 4 - 164.69 U.S. and parallel to Dam Axis at Sta. 9+30A

CM-7	Sta. 9+30A
SM-8	350' East of CM-7
SM-9	600' East of CM-7
SM-10	850' East of CM-7
SM-11	1100' East of CM-7
SM-12	1350' East of CM-7
CM-8	1785' East of CM-7

Line 5 - 19.0 U.S. and parallel to Dam Axis at Sta. 10+30A

CM-9	Sta. 5+70A
SM-13	360' East of CM-9
SM-14	610' East of CM-9
SM-15	860' East of CM-9
SM-16	1110' East of CM-9
SM-17	1360' East of CM-9
CM-10	2920' East of CM-9

Line 6 - 44.31' D.S. and parallel to Dam Axis at Sta. 8+00A

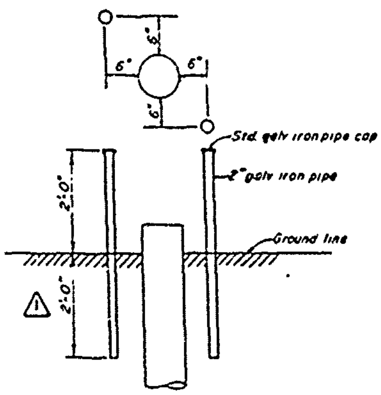
CM-11	Sta. 8+00A
CM-12	120' East of CM-11
SM-18	480' East of CM-11
SM-19	730' East of CM-11
SM-20	980' East of CM-11
SM-21	1230' East of CM-11
SM-22	1480' East of CM-11
SM-23	1730' East of CM-11
CM-13	1865' East of CM-11

Line 7 - 156.81' D.S. and parallel to Dam Axis at Sta. 12+80A

CM-14	135' West of SM-24
SM-24	Sta. 12+80A
SM-25	250' East of SM-24
SM-26	500' East of SM-24
SM-27	750' East of SM-24
SM-28	1000' East of SM-24
CM-15	1530' East of SM-24

Line 8 - 269.31' D.S. and parallel to Dam Axis at Sta. 12+80A

CM-16	100' West of SM-29
SM-29	Sta. 12+80A
SM-30	250' East of SM-29
SM-31	500' East of SM-29
SM-32	750' East of SM-29
CM-17	2130' East of SM-29



SURFACE MONUMENT GUARD

NO SCALE

CONTROL AND SURFACE MONUMENT SCHEDULE (RIGHT EMBANKMENT)

Line 1 - 143.75' U.S. and parallel to Dam Axis at Sta. 0+55A

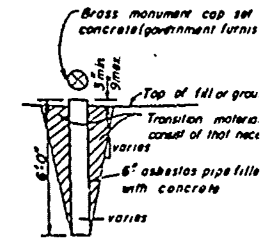
CM-1	Sta. 0+55A
SM-1	140' East of CM-1
SM-2	290' East of CM-1
CM-2	400' East of CM-1

Line 2 - 19' U.S and parallel to Dam Axis at Sta. 0+45A

CM-3	Sta. 0+45A
SM-3	135' East of CM-3
SM-4	240' East of CM-3
SM-5	390' East of CM-3
CM-4	840 East of CM-3

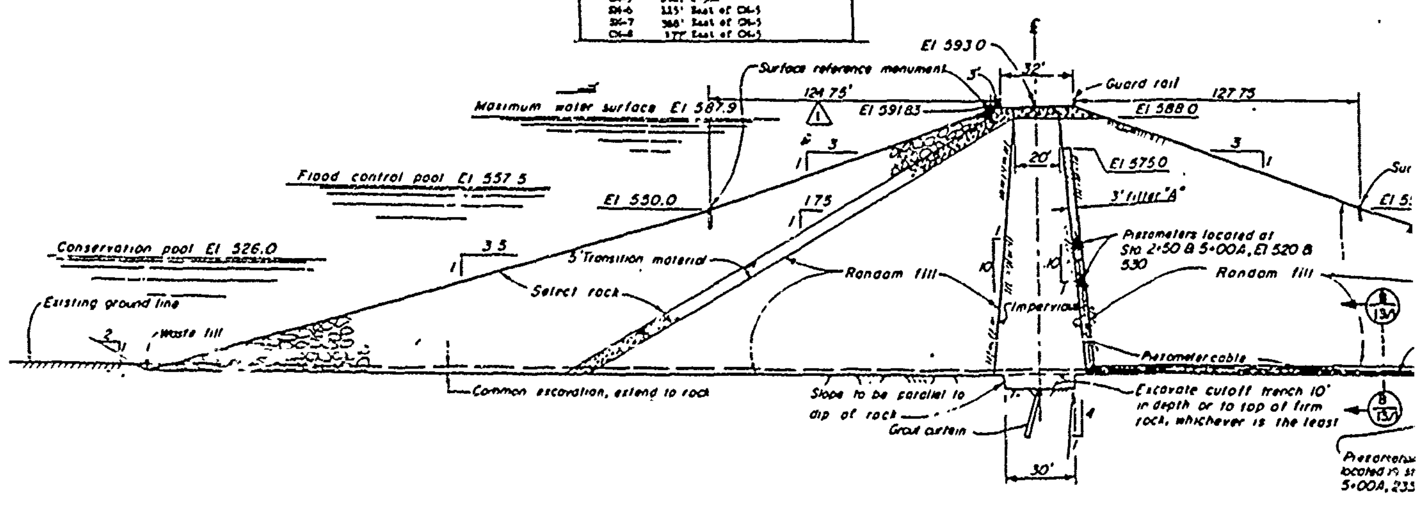
Line 3 - 143.75' D.S. and parallel to Dam Axis at Sta. 2+30A

CM-5	Sta. 2+30A
SM-6	115' East of CM-5
SM-7	368' East of CM-5
CM-6	177' East of CM-5



SURFACE REFERENCE MO

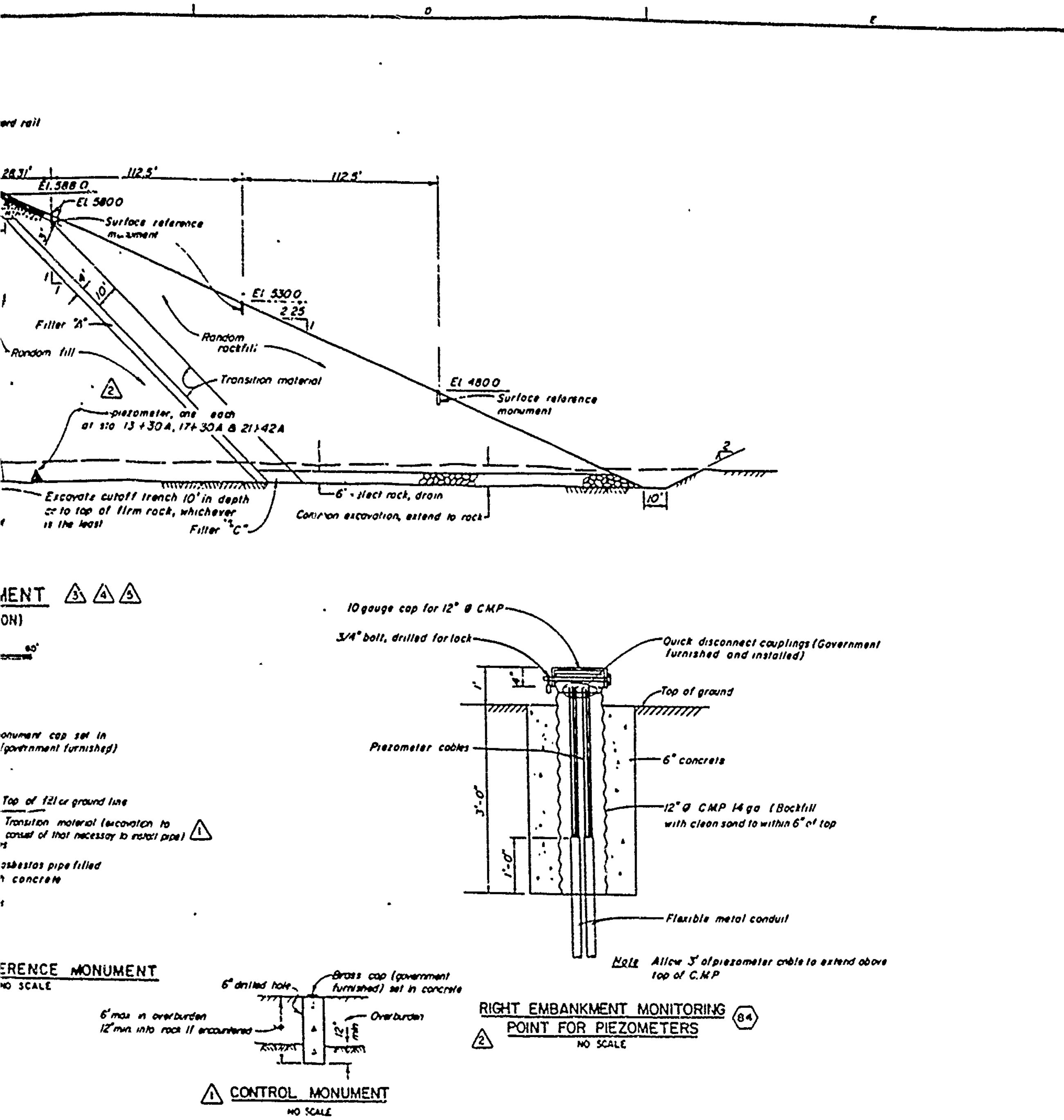
NO SCALE

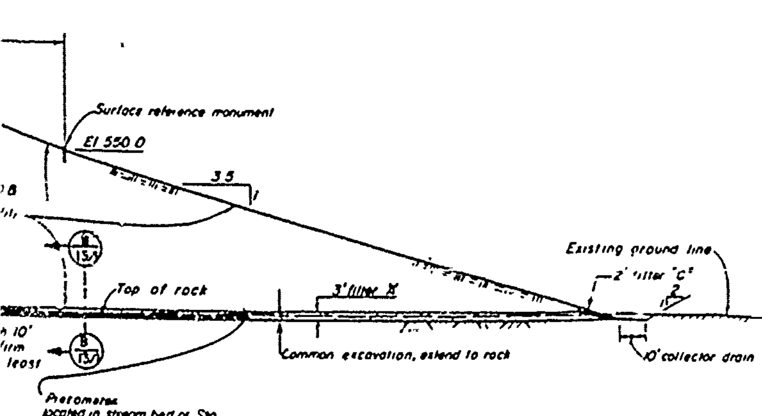


RIGHT EMBANKMENT

(TYPICAL SECTION)

SCALE 1" = 30'





Note
1. Piezometers and cables are government furnished
2. All control monuments locations are approximate

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

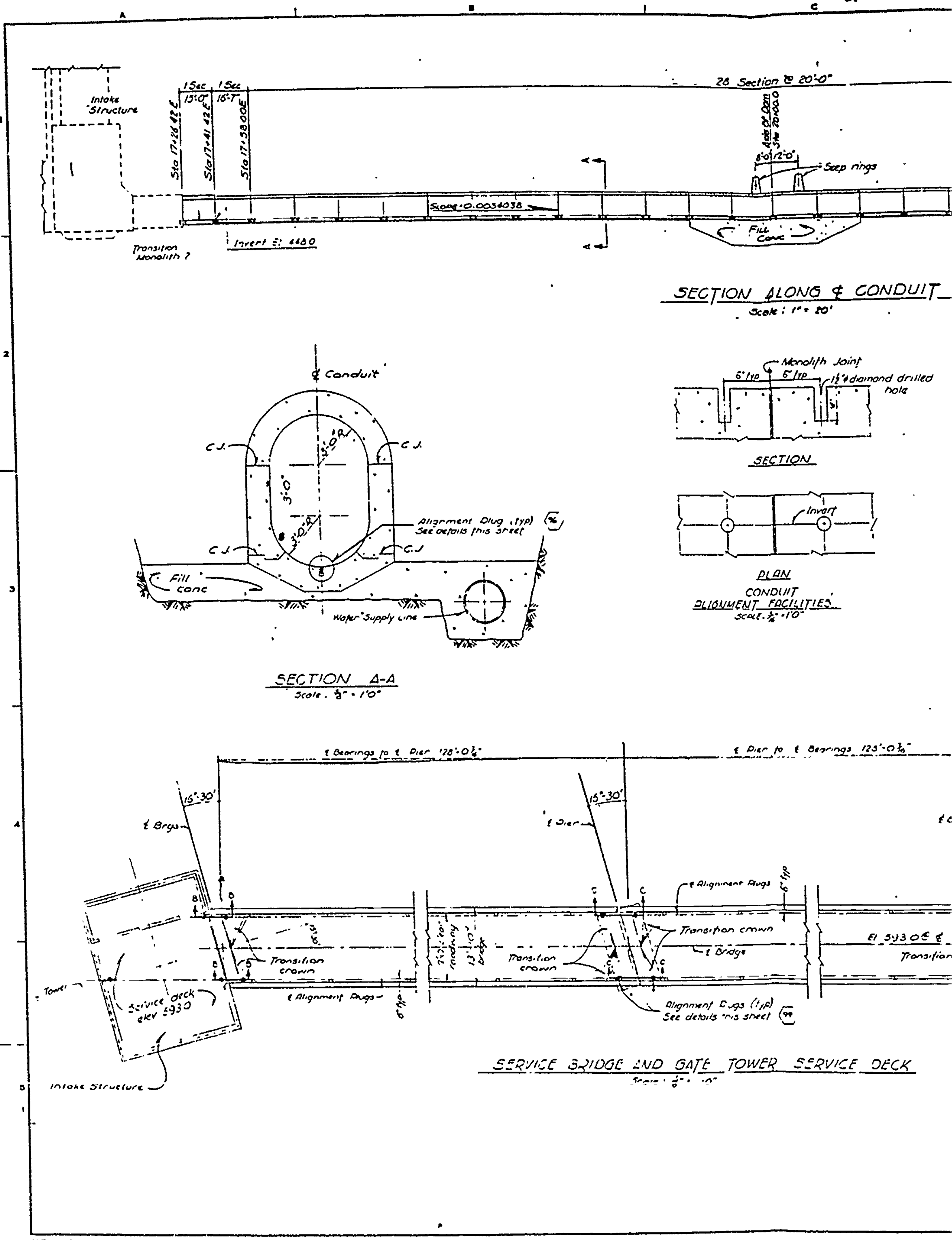
KEY	DATE	CHANGE	REVISION INDICATED BY △	APPR
5	12-5-72	DO 21	Revised top of second stage cofferdam	J.W.
4	4-6-72	DO 18	Typical section of main embankment revised	
3	11-1-71	DO 13	Typical section of main embankment revised	
2	2-11-71	DO 3	Piezometer system revised	
1	5-18-70	Amdt 10004	Revised Control and Surface Monument Schedule and embankment elevations and dimensions and added details	

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA OKLAHOMA

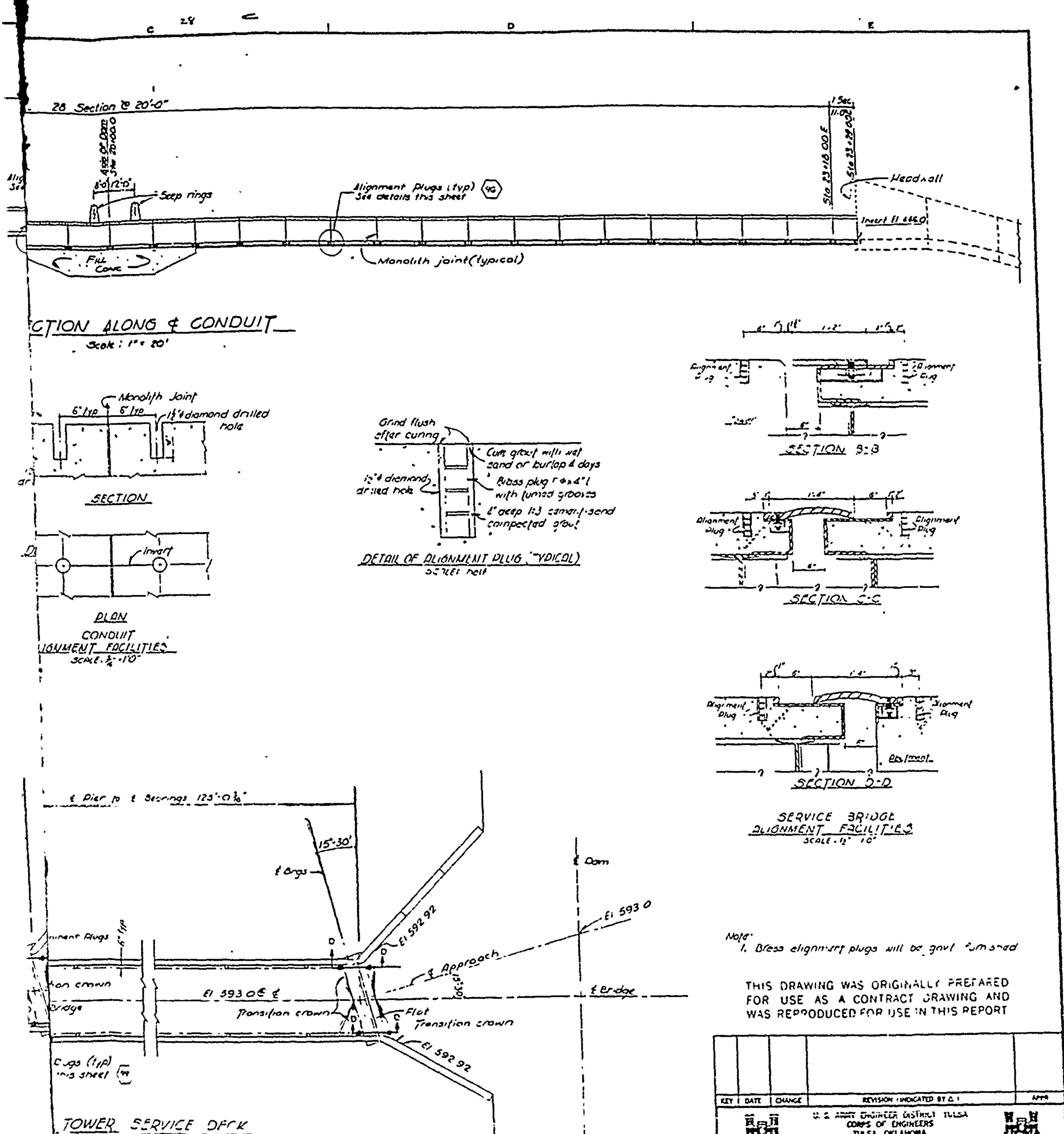
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
ENGINEERING MEASUREMENT DEVICES
EMBANKMENT
SECTIONS AND DETAILS

DESIGNED BY
DRAWN BY B.M. Cotton
CHECKED BY
SUBMITTED
Chief, Des. & Mats. Br.
DATE APR 1970
INVITATION NO. DACW56-70-B-0053
SCALE AS SHOWN
DRAWING NUMBER 1960-C3-13/2.5



Intake Structure
1 Sec
1 Sec
15'-0"
16'-7"
Sta 17+26.42 E
Sta 17+41.42 E
Sta 17+58.00 E
28 Section @ 20'-0"
Axis of Dam Sta 20+00.0
8'-0"
12'-0"
Seep rings
Slope 0.0034038
Fill Conc
Transition Monolith 7
Invert El 4480
SECTION ALONG ¢ CONDUIT
Scale: 1" = 20'
¢ Conduit
C.J.
C.J.
3'-0" R
3'-0"
3'-0" R
Alignment Plug (typ)
See details this sheet
C.J.
C.J.
Fill conc
Water Supply Line
SECTION A-A
Monolith Joint
6" typ
6" typ
1½" ø diamond drilled hole
SECTION
Invert
PLAN
CONDUIT ALIGNMENT FACILITIES
¢ Bearings to ¢ Pier 128'-0¼"
¢ Pier to ¢ Bearings 125'-0⅞"
15°-30'
15°-30'
¢ Brgs
¢ Pier
¢ Alignment Plugs
6" typ
Transition crown
¢ Bridge
El 5930 ¢
Transition
Transition crown
Transition crown
¢ Tower
Service deck elev 5930
¢ Alignment Plugs
6" typ
Alignment Plugs (typ)
See details this sheet
Intake Structure
SERVICE BRIDGE AND GATE TOWER SERVICE DECK



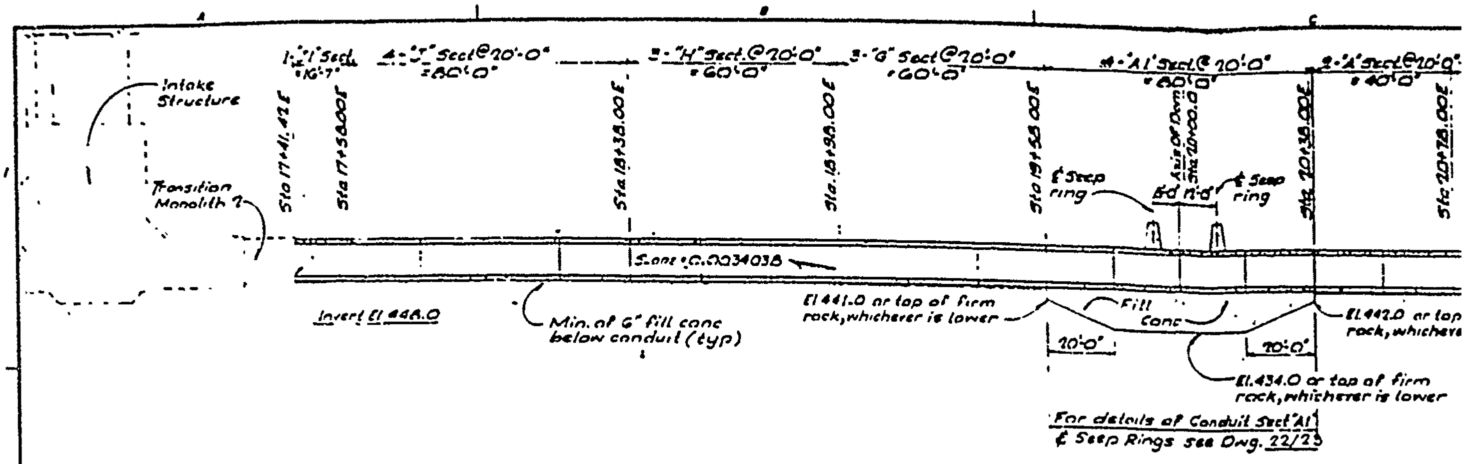
Note:
1. Brass alignment plugs will be govt furnished

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION INDICATED BY △	APPR

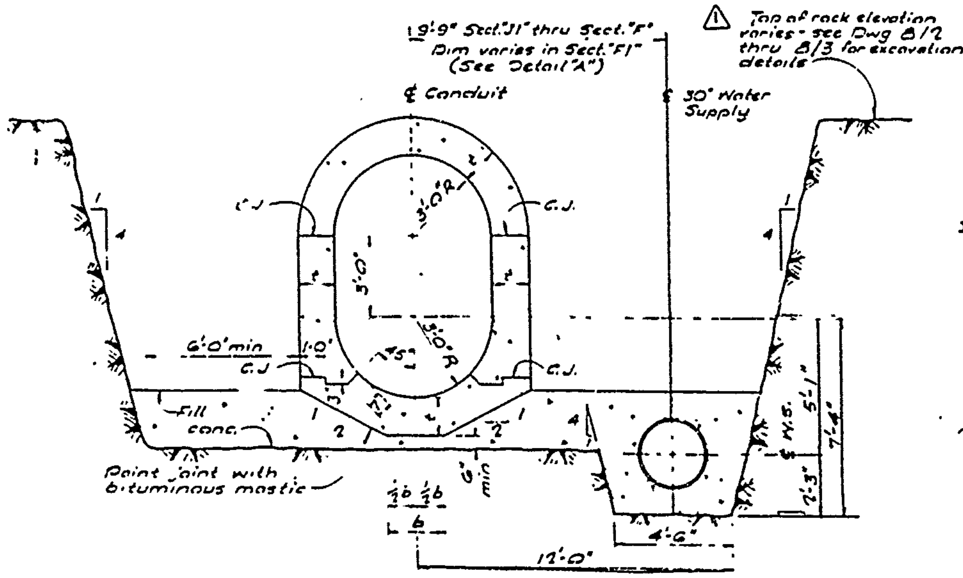
U. S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY: C Davis	RED RIVER WATERSHED — SALINE RIVER, ARKANSAS
DRAWN BY: C Davis	DIERKS DAM
CHECKED BY	EMB., OUTLET WORKS, SPILLWAY & ACCESS RDS. ENGINEERING MEASURING DEVICES
	OUTLET WORKS AND SERVICE BRIDGE - PLAN, SECTIONS AND DETAILS
SUBMITTED: H C Dexter	INVITATION NO. DACW56-70-B-0053
CHIEF, ENGR SEC.	SCALE AS SHOWN
DATE APRIL 1970	DRAWING NUMBER 1960-C3-13/3



SECTION ALONG ℄ CONDUIT

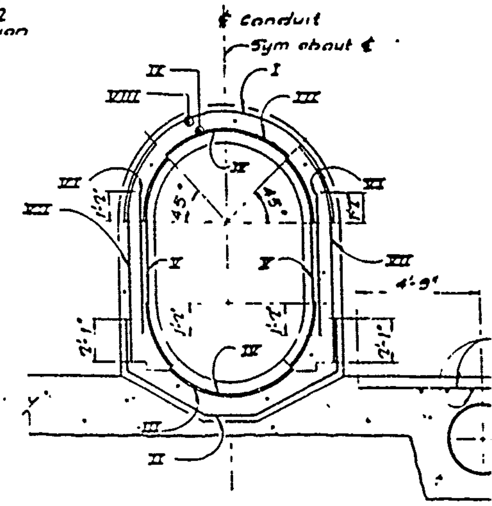
Scale: 1" = 20'



CONCRETE TYPICAL SECTION

(Except Sect. 'A1')

Scale: 3/8" = 1'-0"



REINFORCEMENT TYPICAL SECTION

(Except Sect 'A1')

Scale: 3/8" = 1'-0"

CONCRETE SCHEDULE

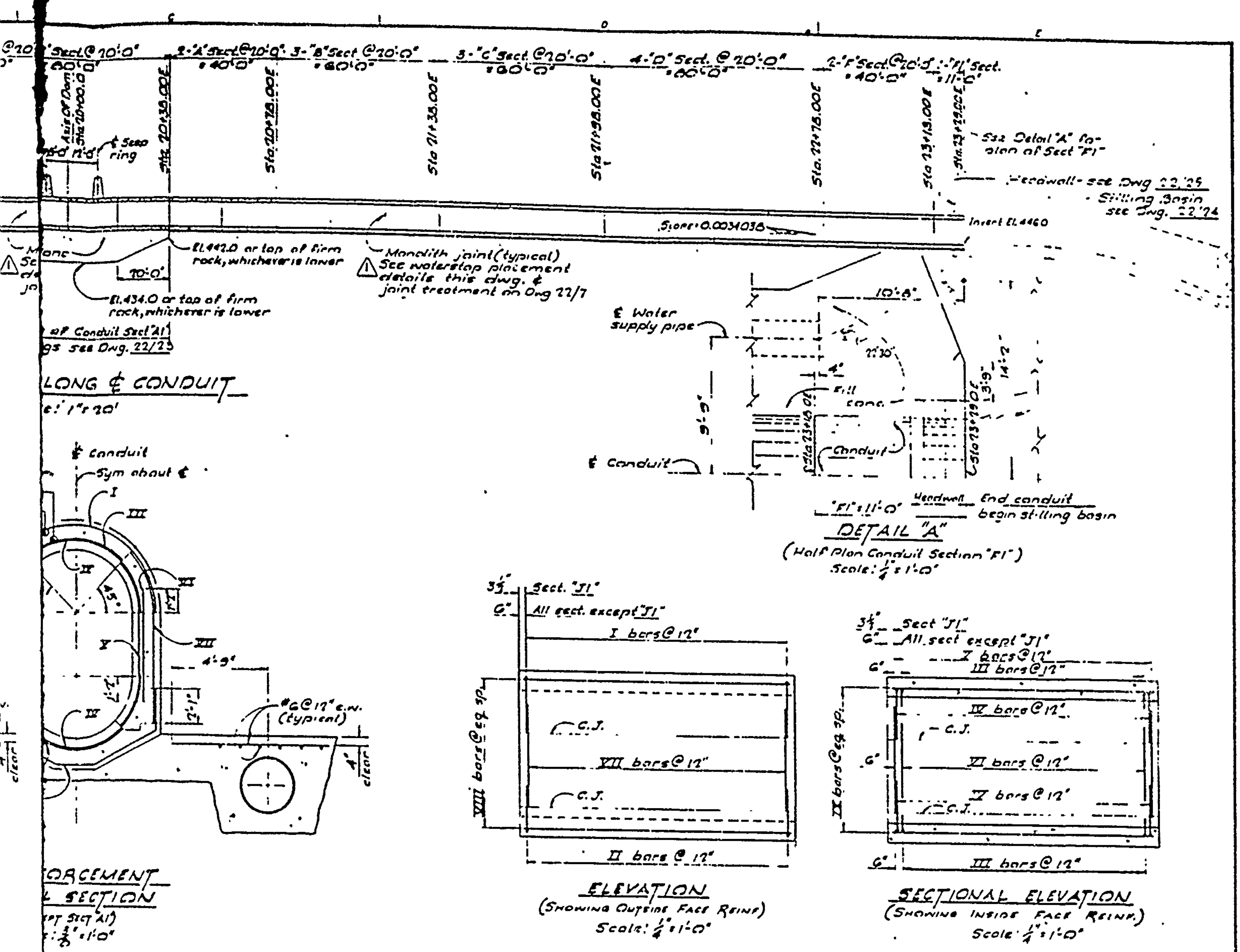
SECTION	NO. SECTIONS REQ'D	b	t	LENGTH
A	2	2'-2"	1'-2"	20'-0"
B	3	2'-2"	1'-5"	20'-0"
C	3	2'-2"	1'-5"	20'-0"
D	4	2'-0"	1'-2"	20'-0"
F	2	2'-0"	1'-2"	20'-0"
G	3	2'-2"	1'-2"	20'-0"
H	3	2'-2"	1'-5"	20'-0"
J	4	2'-2"	1'-5"	20'-0"
F1	1	2'-0"	1'-2"	11'-0"
J1	1	2'-2"	1'-5"	16'-2"
A1	4	See Dwg. 22/23.		

REINFORCEMENT SCHEDULE

SECTION	NO. SECTIONS REQ'D	I SIZE & SPACING	II SIZE & SPACING	III SIZE & SPACING	IV SIZE & SPACING	V SIZE & SPACING	VI SIZE & SPACING	VII SIZE & SPA...
A	2	#8@ 12"	#8@ 12"	#7@ 12"	#8@ 12"	#11@ 12"	#8@ 12"	#8@
B	3	#8@ 12"	#8@ 12"	#7@ 12"	#7@ 12"	#10@ 12"	#7@ 12"	#8@
C	3	#8@ 12"	#8@ 12"	#6@ 12"	#6@ 12	#8@ 12"	#7@ 12"	#8@
D	4	#8@ 12"	#8@ 12"	#6@ 12"	#6@ 12"	#9@ 12"	#7@ 12"	#5@
F	2	#8@ 12"	#8@ 12"	#5@ 12"	#5@ 12"	#6@ 12"	#6@ 12"	#8@
G	3	#8@ 12"	#8@ 12"	#6@ 12"	#7@ 12"	#9@ 12"	#9@ 12"	#8@
H	3	#8@ 12"	#8@ 12"	#5@ 12"	#7@ 12"	#10@ 12"	#10@ 12"	#5@
J	4	#8@ 12"	#8@ 12"	#5@ 12"	#6@ 12"	#9@ 12"	#9@ 12"	#8@
F1	1	#8@ 12"	#8@ 12"	#5@ 12"	#5@ 12"	#6@ 12"	#9@ 12"	#8@
J1	1	#8@ 12"	#8@ 12"	#5@ 12"	#6@ 12"	#9@ 12"	#9@ 12"	#8@
A1	4	See Dwg. 22/23						

NOTES:

1. For "General Notes" and "General Reinforcement Notes" see Dwg 22/2
2. Concrete
   a. Concrete for conduit sections will be paid for under Bid Item - 96
   b. Concrete for seep rings under Bid Item - 101
   c. Fill concrete when used as conduit base and water supply pipe encasement under Bid Item - 101
   d. Fill concrete when used as excavation fill under Bid Item - 101
3. Conduit reinf. is 4... face and 3" clear ou...

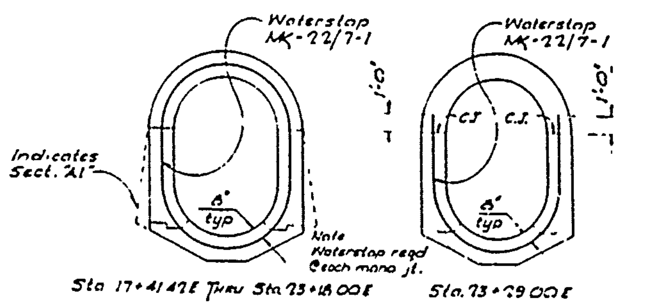


SCHEDULE

VIII SIZE &	V SIZE & SPACING	VI SIZE & SPACING	VII SIZE & SPACING	XIII * QUAN, SIZE & SPACING	IX * QUAN, SIZE & SPACING
#5@	11@ 12"	#6@ 12"	#6@ 12"	24-#5@ eq sp	21-#5@ eq sp.
#5@	10@ 12"	#7@ 12"	#6@ 12"	21-#5@ eq sp	19-#5@ eq sp
#5@	8@ 12"	#7@ 12"	#8@ 12"	21-#5@ eq. sp	19-#5@ eq. sp
#5@	9@ 12"	#7@ 12"	#5@ 12"	20-#5@ eq sp.	19-#5@ eq sp
#5@	6@ 12"	#6@ 12"	#8@ 12"	20-#5@ eq sp	19-#5@ eq sp
#5@	9@ 12"	#9@ 12"	#6@ 12"	24-#5@ eq. sp	21-#5@ eq sp
#5@	10@ 12"	#10@ 12"	#5@ 12"	21-#5@ eq. sp	19-#5@ eq. sp
#5@	8@ 12"	#9@ 12"	#8@ 12"	21-#5@ eq. sp	19-#5@ eq. sp.
#5@	6@ 12"	#6@ 12"	#8@ 12"	20-#5@ eq sp	19-#5@ eq sp
#5@	9@ 12"	#9@ 12"	#8@ 12"	21-#5@ eq. sp.	19-#5@ eq. sp.

uantit... | * Quantities shown for one conduit section

3 Conduit reinf. is 4" clear inside face and 3" clear outside face.



WATERSTOP PLACEMENT
Scale: 1/4" = 1'-0"

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

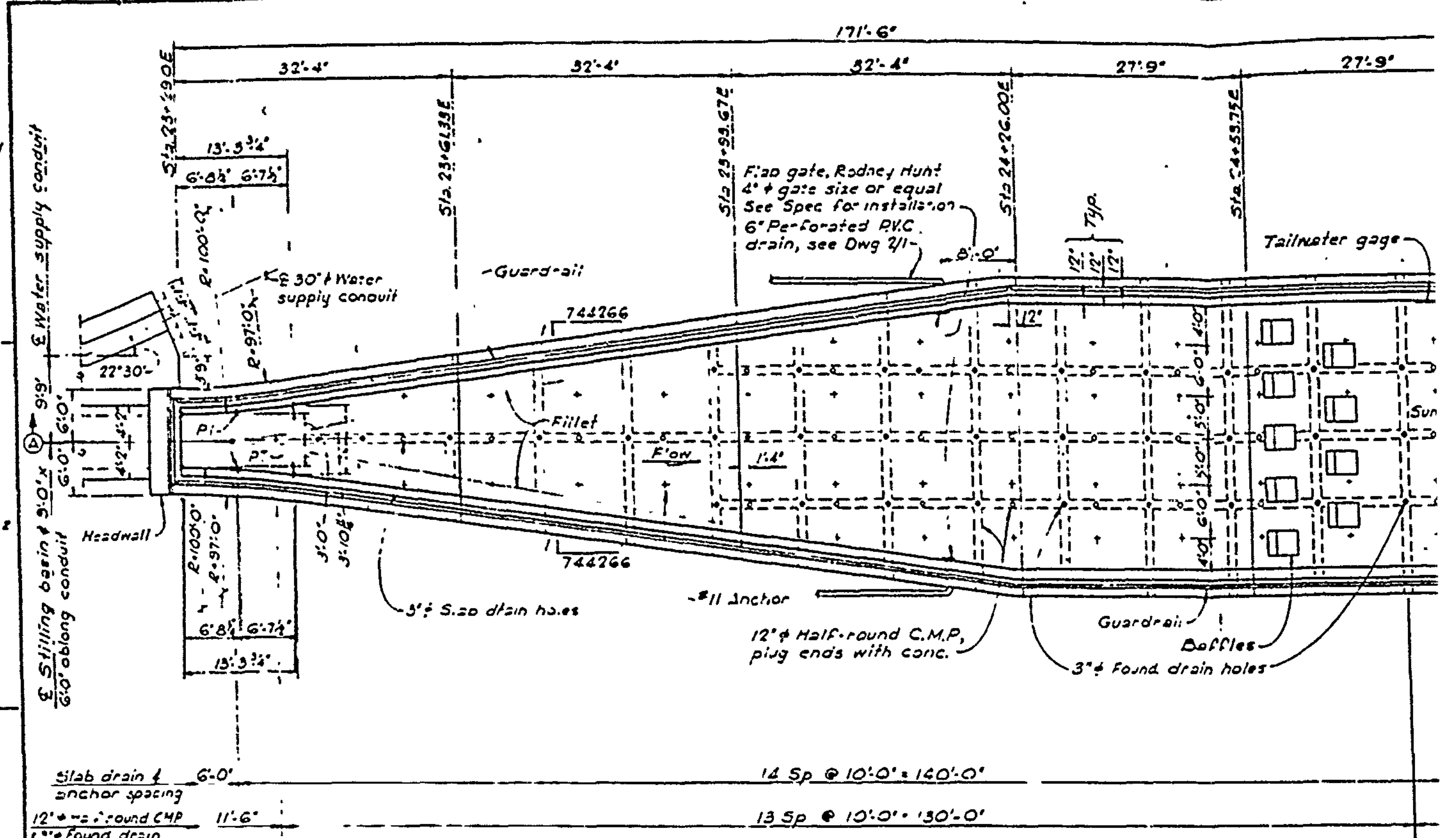
KEY	DATE	CHANGE	APPR
1		Revised size of reinf bars I, II & VII	

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

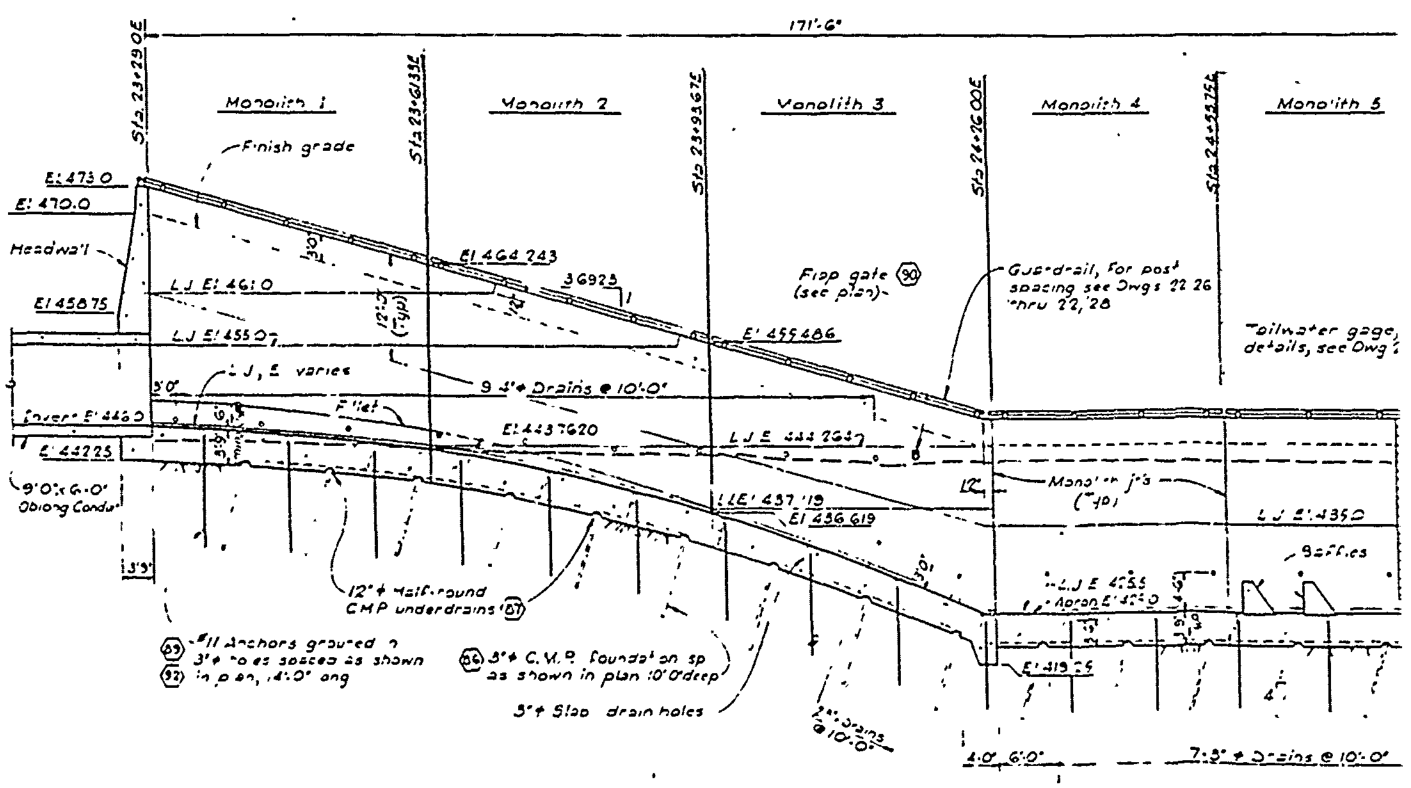
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
OUTLET WORKS – CONDUIT
CONCRETE AND REINFORCING – CONDUIT AND SEEP RINGS – SECTIONS AND DETAILS I

Designed by: W Scott Clawson
Drawn by: Don Prentice
Checked by: Lester Starr
Submitted: L Starr, Chief Str Sec "A"
Date: APRIL 1970
Invitation No: DACW56-70-B-0033
Scale: AS SHOWN
Drawing Number: 1960-C3-22/22.1

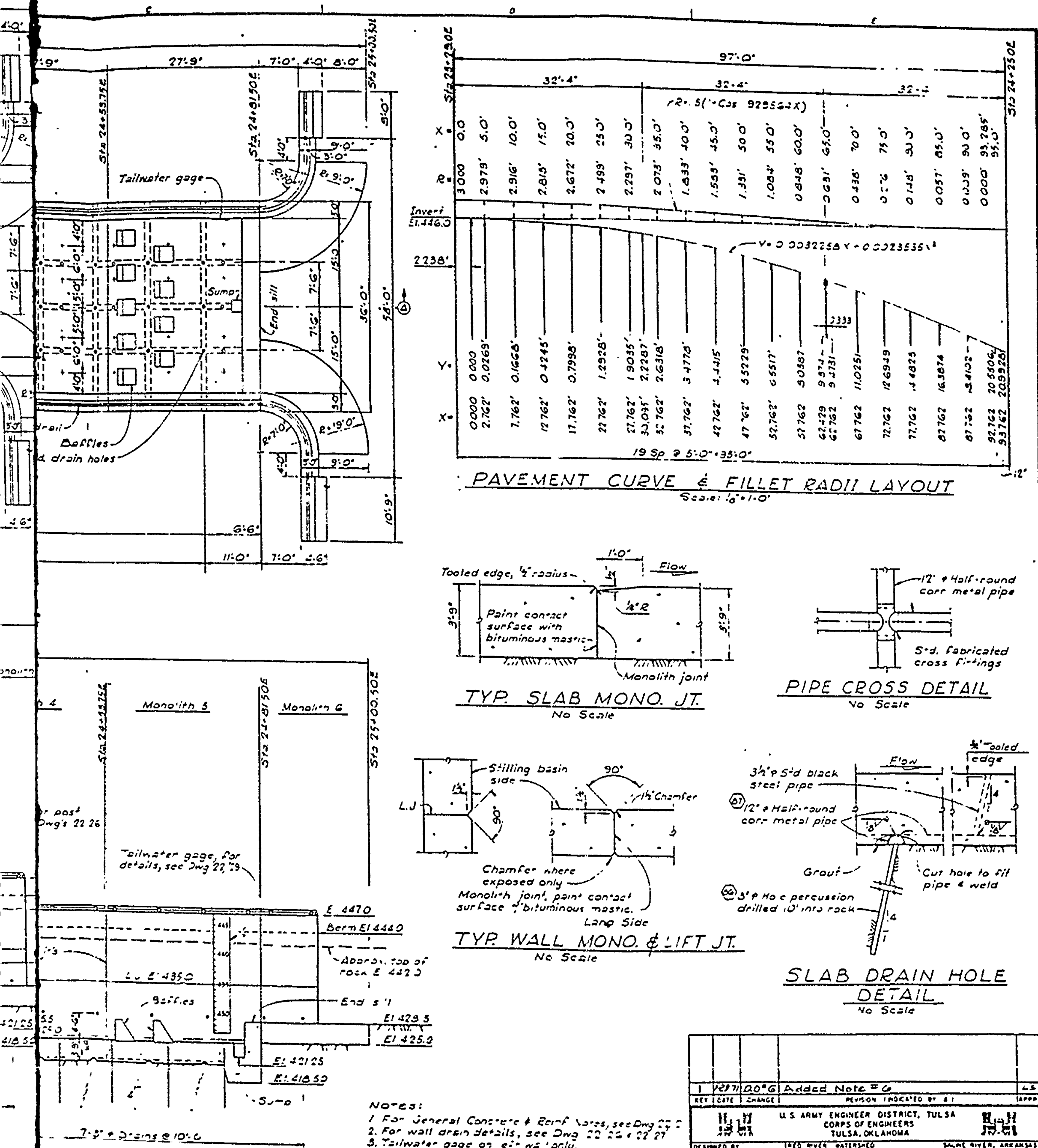


PLAN
Scale: 1/8" = 1'-0"



SECTION A-A
Scale 1/8" = 1'-0"

(1)



NOTES:

1. For General Concrete & Reinf Notes, see Dwg 22/2
2. For wall drain details, see Dwg 22/26 & 22/27
3. Tailwater gage on left wall only.
4. For baffle details & reinf, see Dwg 22/25
5. Concrete shown on this drawing to be paid for under Bid Item 97.
6. For details and location of electrical sensor recess see Dwg 70/8.1

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION INDICATED BY	APPR
1	12-71	D.O. 6	Added Note # 6	L.S.

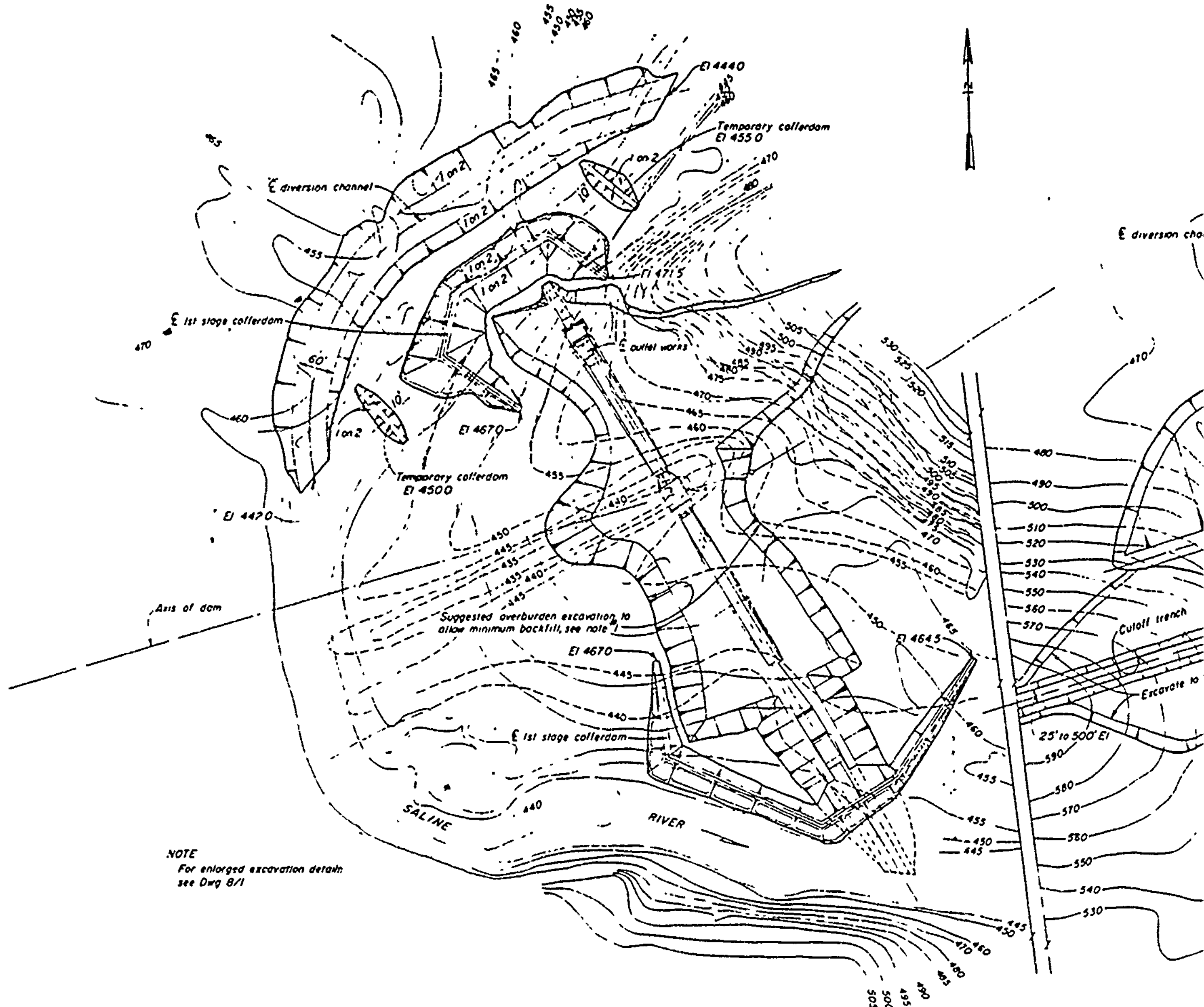
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS.
OUTLET WORKS - STILLING BASIN
GENERAL PLAN, ELEVATION & DETAILS

DESIGNED BY: C.Y. Cheng
DRAWN BY: Gary D. Cheatham
CHECKED BY: Starr
SUBMITTED: J. Stin

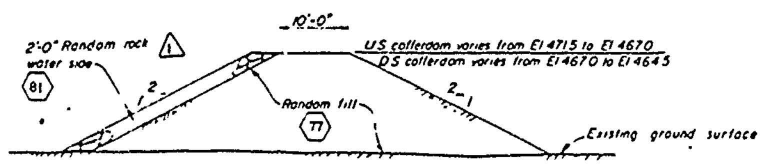
INVITATION NO. DACW56-70-B-0033
SCALE AS SHOWN
DATE APRIL 1970
DRAWING NUMBER 1960-C3-22/24.1



NOTE
For enlarged excavation details see Dwg 8/1

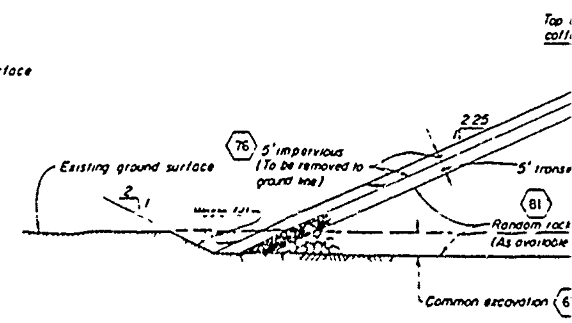
FIRST STAGE DIVERSION

SCALE 1 INCH = 100 FEET

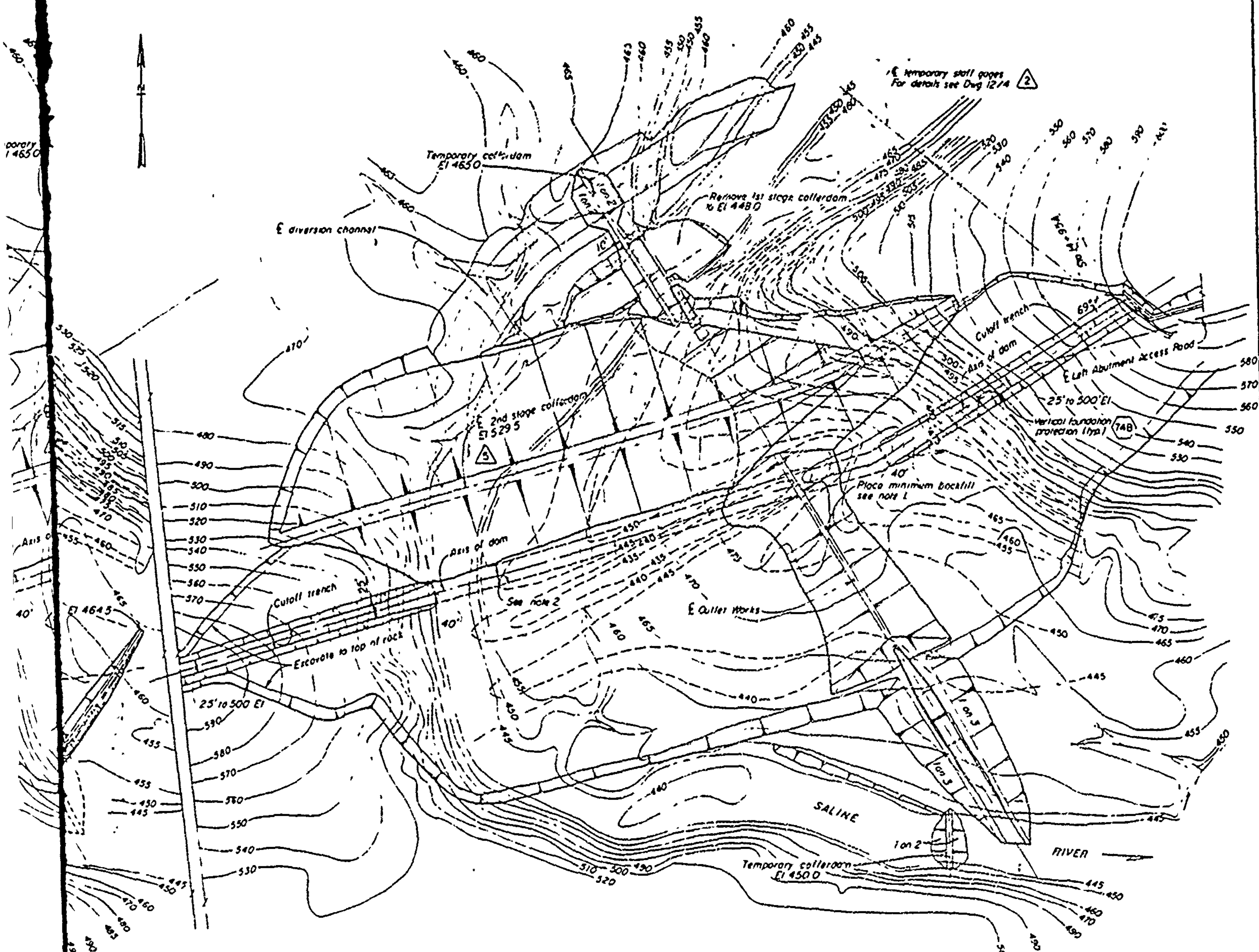


FIRST STAGE COFFERDAM

NO SCALE



SECOND S



SECOND STAGE DIVERSION

SCALE 1 INCH = 100 FEET

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

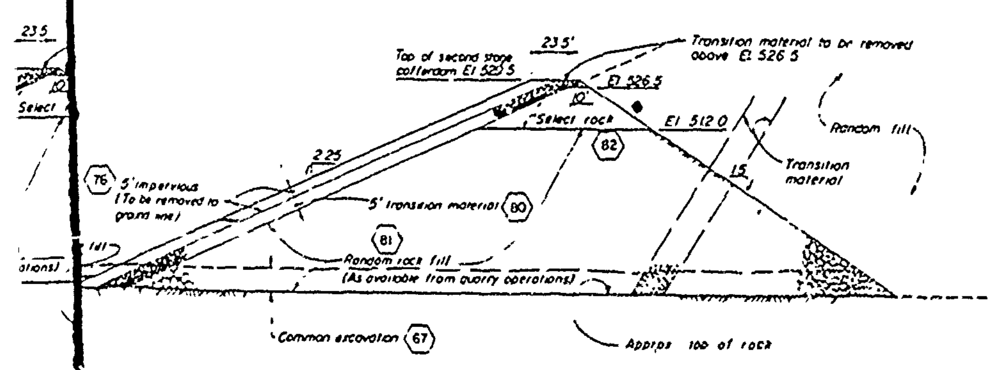
LEGEND

—— Top of ground contours

- - - Top of rock contours

NOTE

1. It is mandatory to place permanent backfill over the conduit to El 469.0, before diverting through the structure
2. Generally, there will be no well defined trench across the flood plain



SECOND STAGE COFFERDAM-TYPICAL SECTION 3 4 5

(2nd STAGE DIVERSION)

SCALE 1"=30

KEY	DATE	CHANGE	APPR
5	12-5-72	DO 21 Revised top of second stage cofferdam	
4	4-6-72	DO-18 Typical section of 2nd stage cofferdam revised	
3	11-1-71	DO-13 Typical section of 2nd stage cofferdam revised	
2	1-29-71	DO #6 Temporary staff gages added	
1		Revised ...	

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

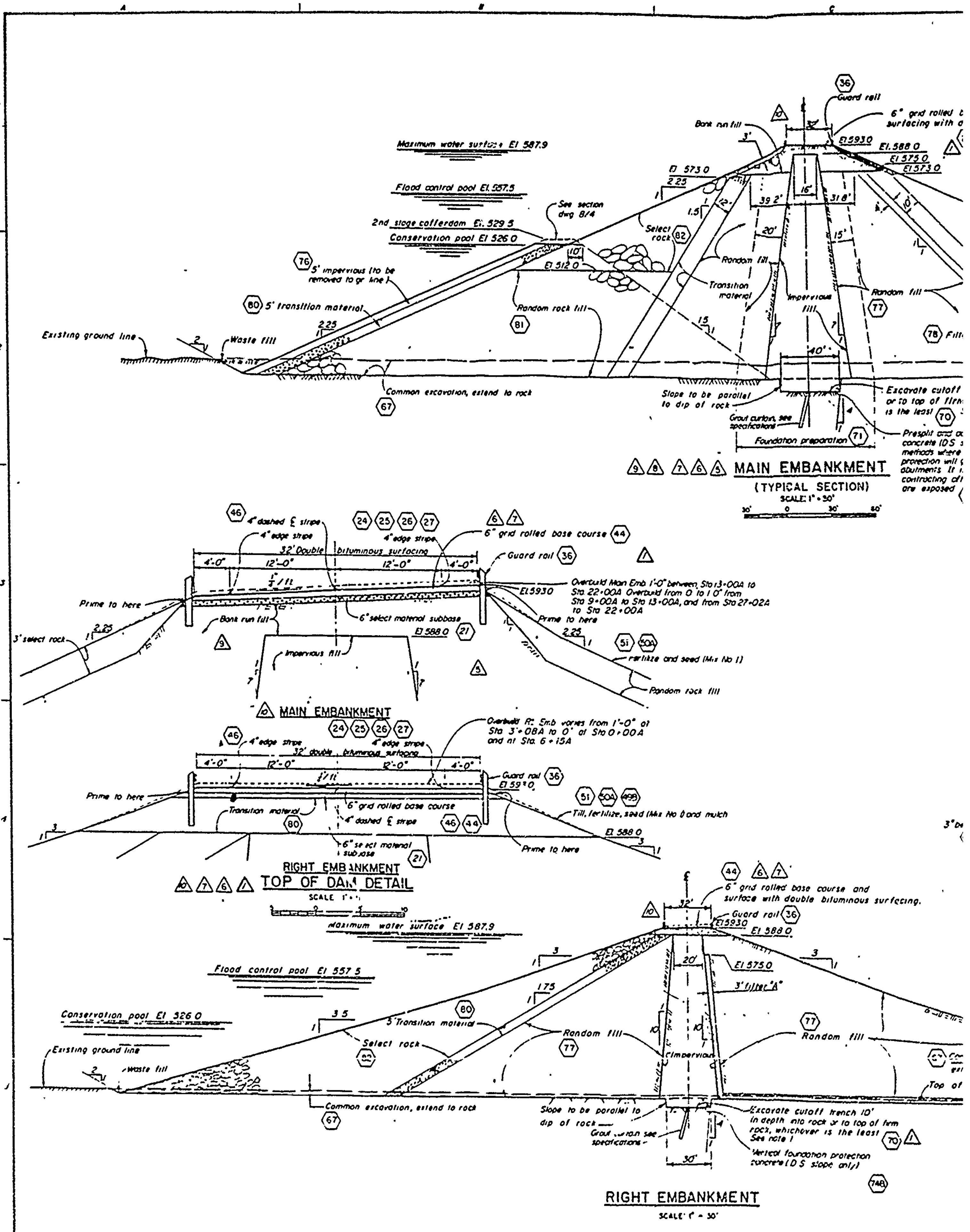
DIERKS DAM
EMB. OUTLET WORKS, SPILLWAY & ACCESS RDS
DIVERSION & EXCAVATION
FIRST STAGE & SECOND STAGE DIVERSION - PLANS & SECTIONS

DESIGNED BY / DRAWN BY / CHECKED BY / SUBMITTED: CHIEF, DESIGN SEC

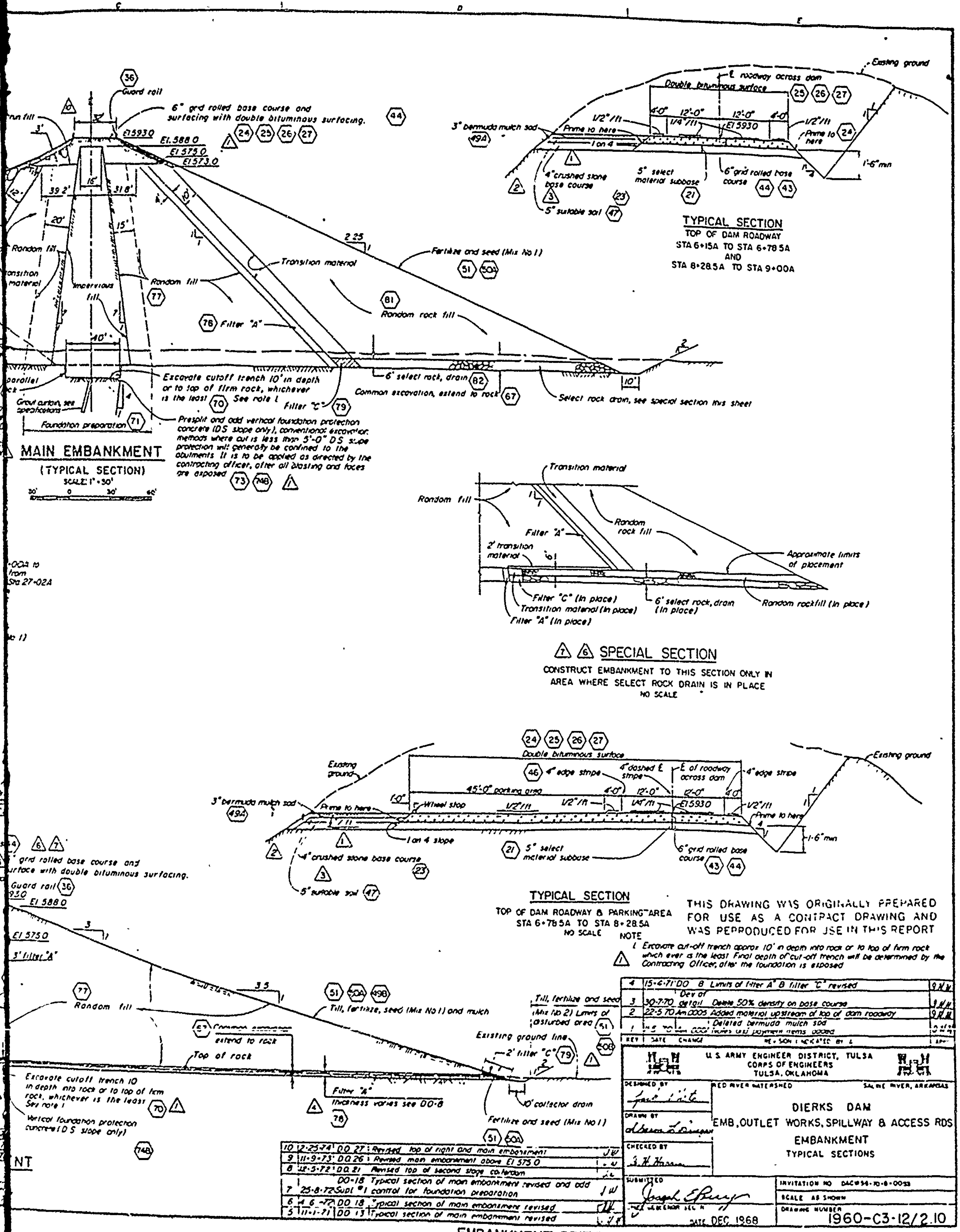
DATE JUNE 1970

SCALE AS SHOWN

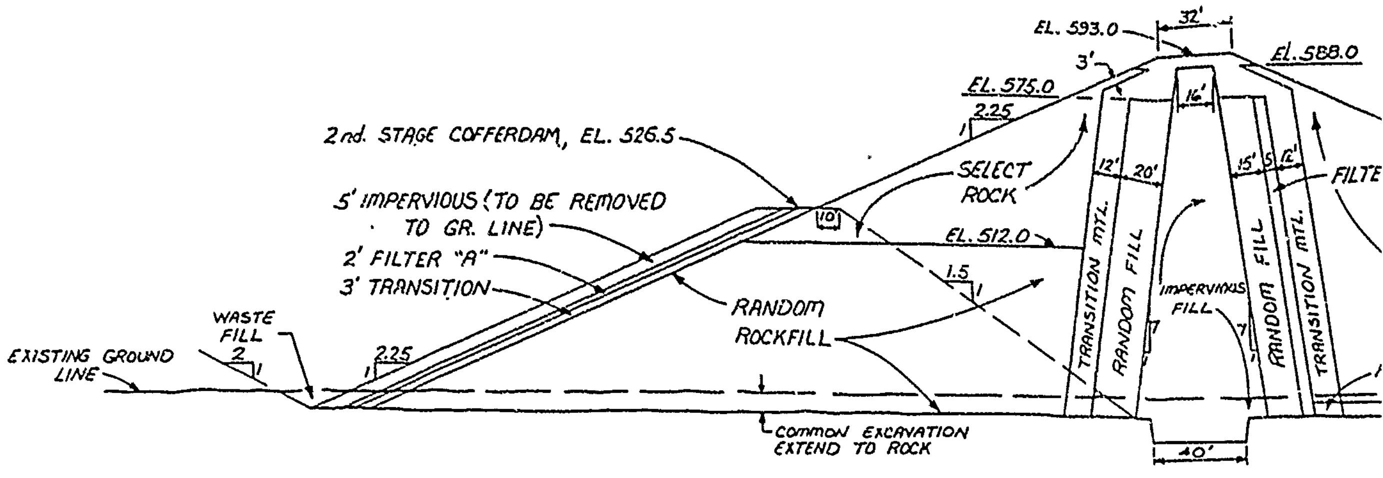
DRAWING NO 1960-C3-8/4.5



Maximum water surface El 587.9
Flood control pool El 557.5
2nd stage cofferdam El 529.5
Conservation pool El 526.0
Guard rail
Bank run fill
El 593.0
El 588.0
El 575.0
El 573.0
See section dwg 8/4
Select rock
Random fill
Transition material
Impervious fill
5' impervious (to be removed to gr line)
5' transition material
Random rock fill
Existing ground line
Waste fill
Common excavation, extend to rock
Slope to be parallel to dip of rock
Grout curtain, see specifications
Foundation preparation
MAIN EMBANKMENT
(TYPICAL SECTION)
SCALE: 1" = 30'
4" dashed ℄ stripe
4" edge stripe
32' Double bituminous surfacing
6" grid rolled base course
Overbuild Main Emb 1'-0" between Sta 13+00A to Sta 22+00A Overbuild from 0 to 1'0" from Sta 9+00A to Sta 13+00A, and from Sta 27+02A to Sta 22+00A
Prime to here
3' select rock
6" select material subbase
Fertilize and seed (Mix No 1)
Random rock fill
MAIN EMBANKMENT
Overbuild Rt Emb varies from 1'-0" at Sta 3+08A to 0" at Sta 0+00A and at Sta 6+15A
Till, fertilize, seed (Mix No 6) and mulch
6" select material subbase
RIGHT EMBANKMENT
TOP OF DAM DETAIL
6" grid rolled base course and surface with double bituminous surfacing.
3' filter "A"
Random fill
Impervious
Excavate cutoff trench 10' in depth into rock or to top of firm rock, whichever is the least. See note 1
Vertical foundation protection concrete (D S slope only)
RIGHT EMBANKMENT
SCALE: 1" = 30'



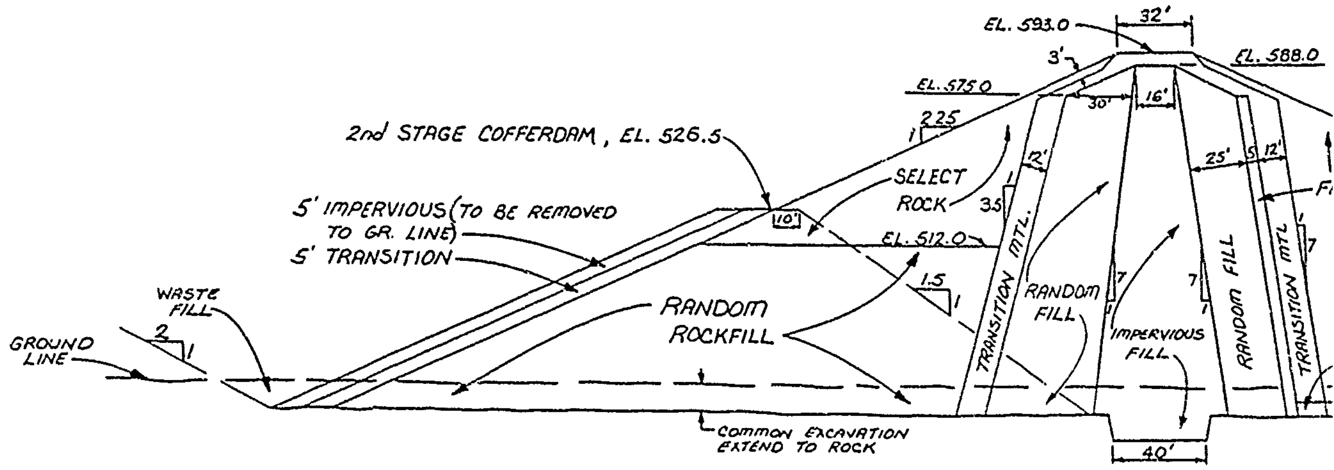
EMBANKMENT CRITERIA AND PERFORMANCE REPORT - PLATE NO. 28



MAIN EMBANKMENT

TYPICAL CONTRACT SECTION

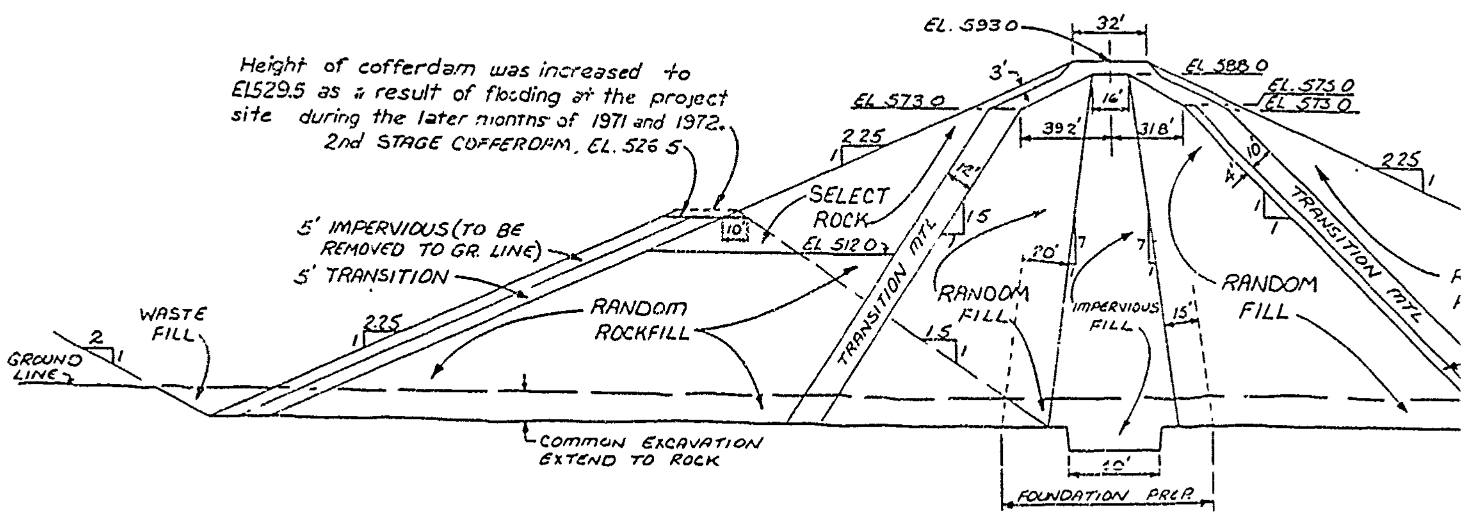
NO SCALE



MAIN EMBANKMENT

TYPICAL SECTION - SEPTEMBER 1971 R

NO SCALE

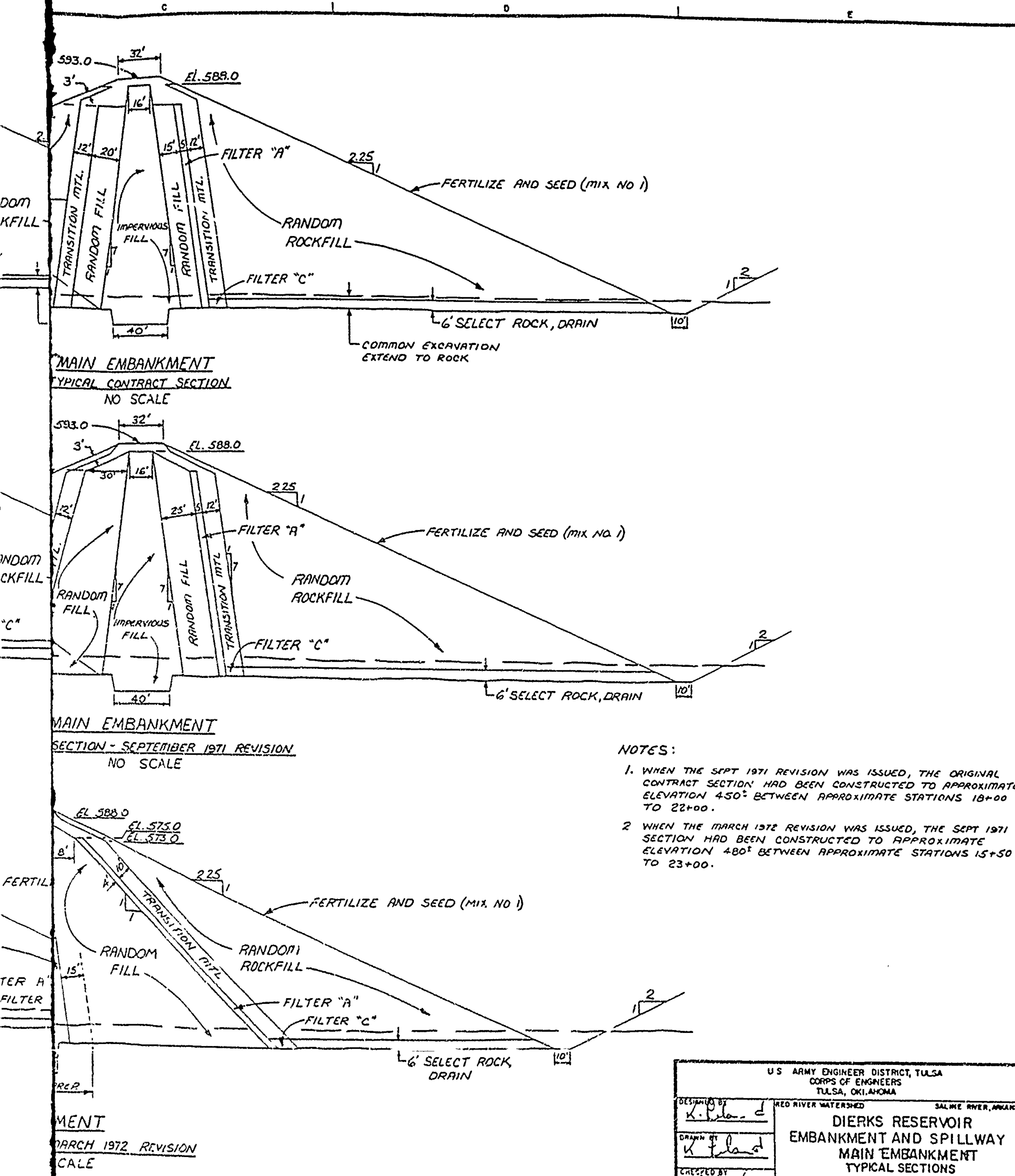


MAIN EMBANKMENT

TYPICAL SECTION - MARCH 1972 REVISION

NO SCALE

(1)



NOTES:

1. WHEN THE SEPT 1971 REVISION WAS ISSUED, THE ORIGINAL CONTRACT SECTION HAD BEEN CONSTRUCTED TO APPROXIMATE ELEVATION 450± BETWEEN APPROXIMATE STATIONS 18+00 TO 22+00.
2. WHEN THE MARCH 1972 REVISION WAS ISSUED, THE SEPT 1971 SECTION HAD BEEN CONSTRUCTED TO APPROXIMATE ELEVATION 480± BETWEEN APPROXIMATE STATIONS 15+50 TO 23+00.

US ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

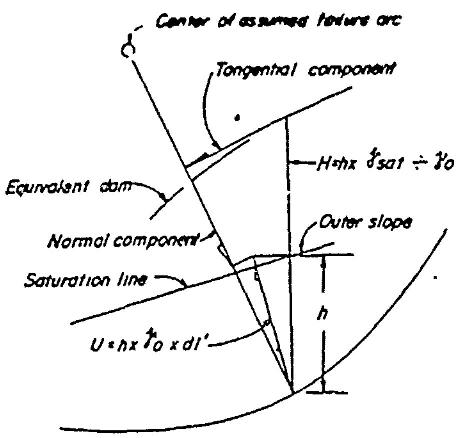
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
MAIN EMBANKMENT
TYPICAL SECTIONS

DESIGNED BY / DRAWN BY / CHECKED BY / SUBMITTED — CHIEF, SOILS MECH. SEC.

SCALE AS SHOWN — TO ACCOMPANY SUPPLEMENT NO 2

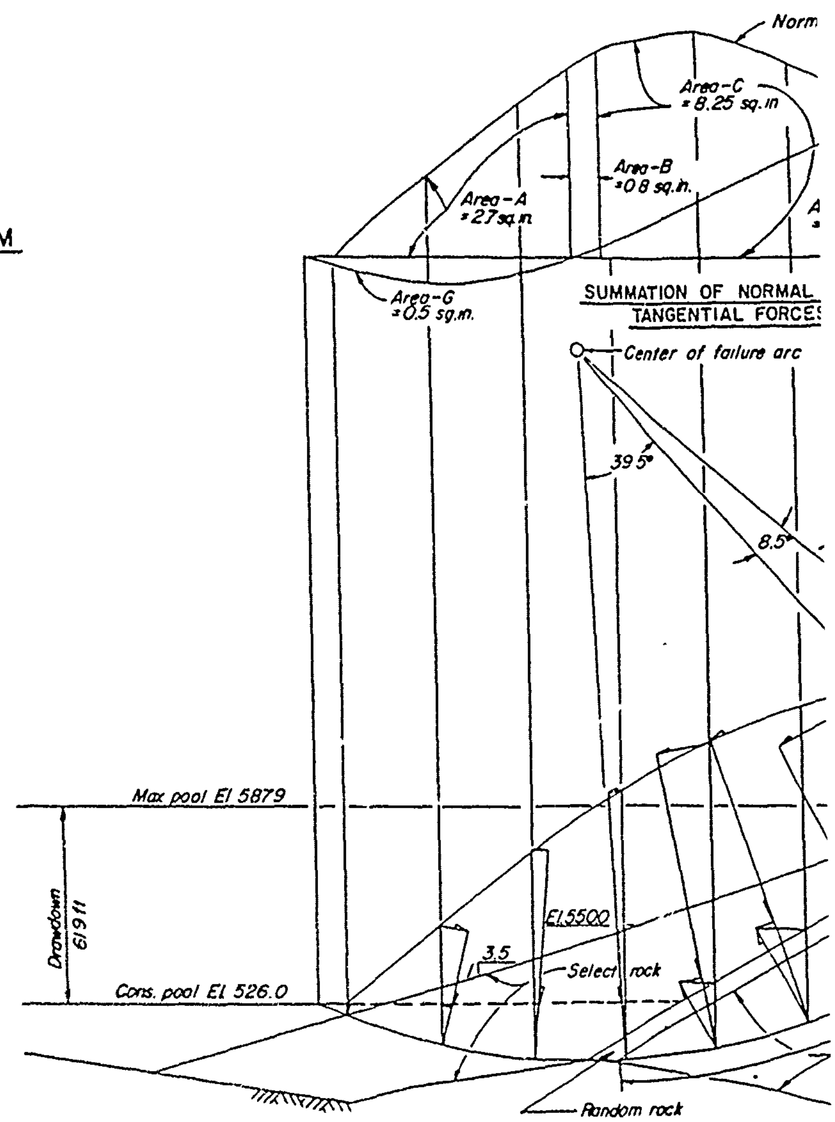
DATE DEC 1972 — DRAWING NO 1960-DM8-12/5



TYPICAL FORCE DIAGRAM

1 sq. in = 28.125 Tons

AREA SCALE



SAFETY FACTOR SUMMARY			
Radius (feet)	Coordinates (center of arc)		Safety factor
	X (ft)	Y (ft)	
61	-50	9	187
68	-59	5	1.74
94	-85	20	150
97	-107	6	155
104	-85	54	177
108	-112	42	176
140	-138	54	149
222	-162	137	141
301	-168	229	173
310	-232	219	181

NOTES:

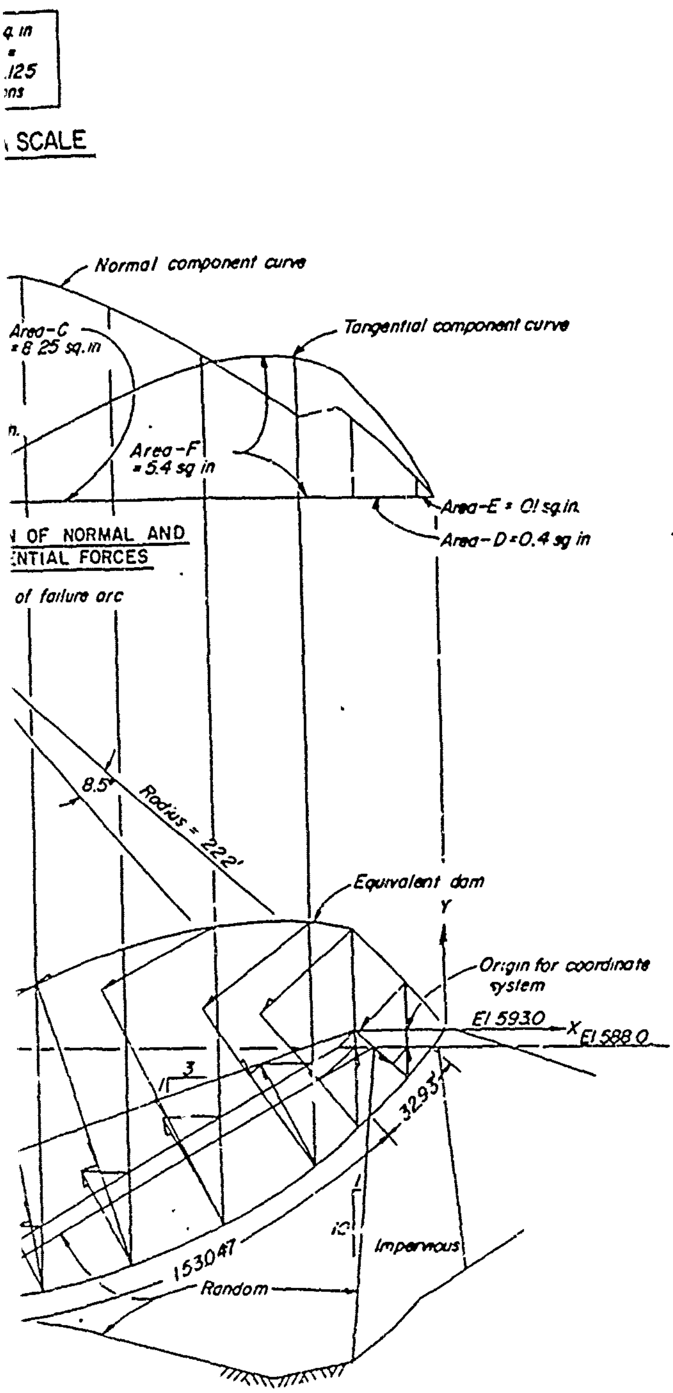
The above table includes results of all arcs analyzed for the sudden drawdown condition. Coordinates for arc centers are referenced from the ℄ and crest of the dam

STABILITY ANALYSIS OF UPSTREAM SLOPE

CONDITION OF SUDDEN DRAWDOWN

SCALE: 1" = 30'

30' 0 30' 60'



ADOPTED DESIGN DATA					
Materials	Unitweight lbs / cu.ft		Shear strengths *		
	Saturated	Submerged	Q	R	S
Select rock	135	72.6	φ=39° C=0	φ=39° C=0	φ=39° C=0
Random rock	135	72.6	φ=33° C=0	φ=33° C=0	φ=33° C=0
Transition mat'l	135	72.6	φ=33° C=0	φ=33° C=0	φ=33° C=0
Impervious	125	62.5	φ=10° C=0.6	φ=14° C=0.1	φ=27° C=0
Random	125	62.5	φ=10 C=0.4	φ=12° C=0.4	φ=29° C=0

(*) φ = Angle of internal friction (degrees)
C = Cohesion (Tons/ft²)

FORCES ACTING ON FAILURE ARC

Positive tangential force Area – F = 151.875 Tons
Negative tangential force Area – G = –14.063 Tons
Total = 137.812

NORMAL AND RESISTING FORCES

Normal force Area ———— A = 75.938 Tons
Normal force Area ———— B+E = 22.031 Tons
Normal force Area ———— C = 232.031 Tons
Normal force Area ———— D = 11.250 Tons
Cohesion (LC)
= (153.047x0.4) + (32.93x0.1) ———— 64.509 Tons

SAFETY FACTOR COMPUTATIONS

Formula $S.F. = \dfrac{\Sigma N \times \tan\phi + LC}{\Sigma T}$

For consolidated undrained (R) condition

$$S.F. = \frac{75.938 \times \tan 39° + 22.781 \times \tan 33° + 232.031 \times \tan 12° + 11.250 \times \tan 14° + 64.509}{137.812}$$

$S.F. = \underline{1.40}$

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

REAM SLOPES UNDER
N DRAWDOWN

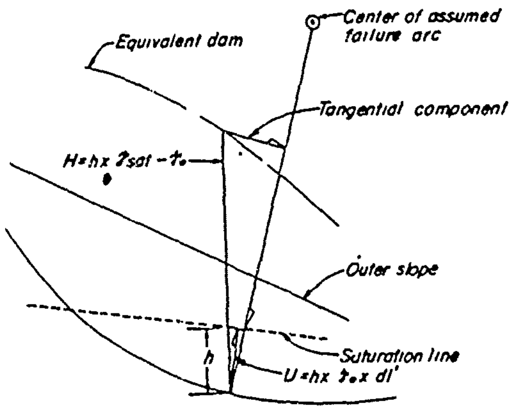
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

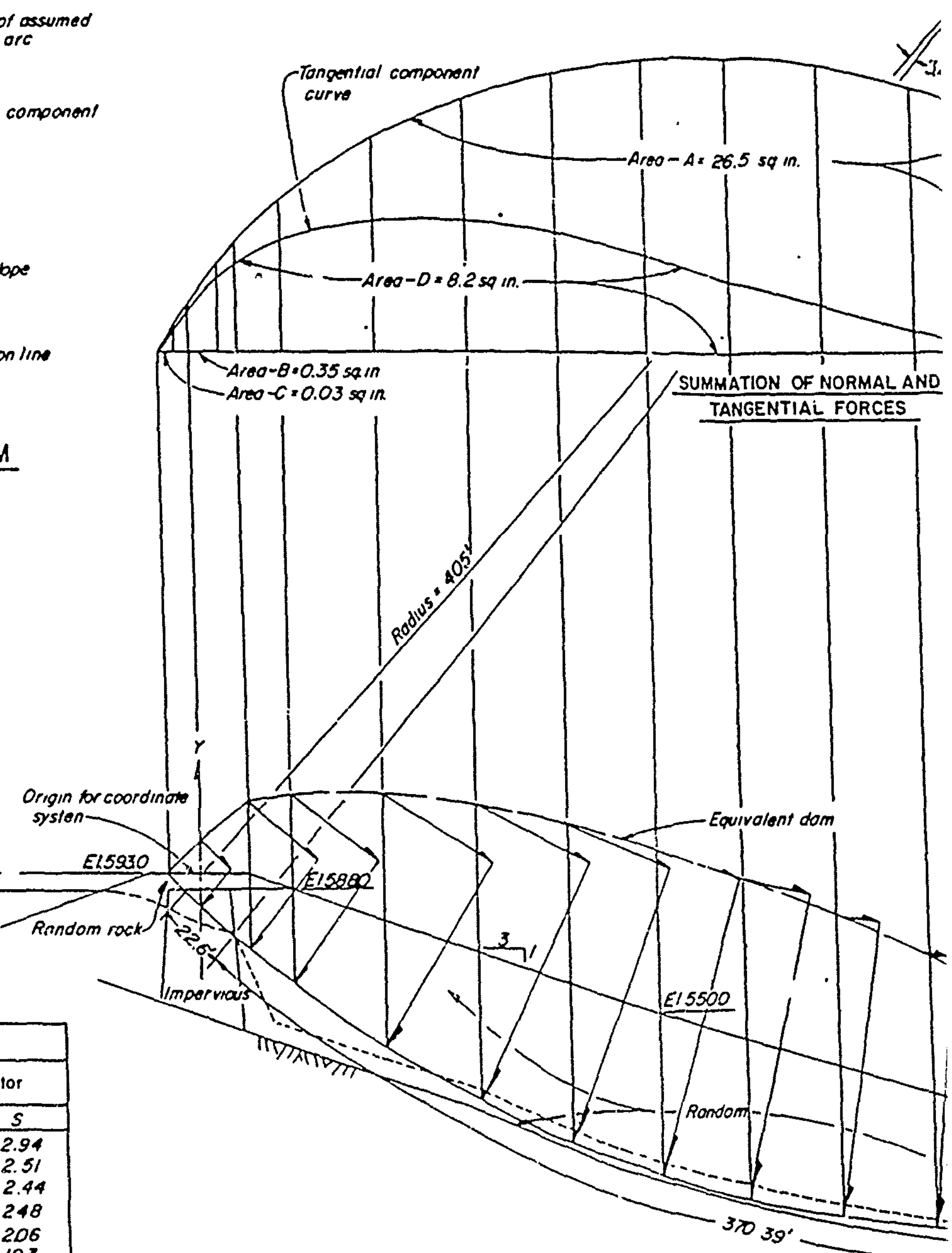
DIERKS DAM AND RESERVOIR
RIGHT EMBANKMENT
UPSTREAM STA. 2+50
STABILITY ANALYSIS-SUDDEN DRAWDOWN COND.

	BY	CHKD
DESIGNED		
DRAWN		
TRACED		

SUBMITTED — CHIEF, SOILS DESIGN SEC.
RECOMMENDED — CHIEF, FND & MATLS SEC.
APPROVED — CHIEF, ENGRG DIV, FOR THE DIST ENGINEER
DATE NOV. 1967
SCALE AS SHOWN
DRAWING NO. 1960-DM8-97/10



TYPICAL FORCE DIAGRAM



SAFETY FACTOR SUMMARY				
Radius (feet)	Coordinates (center of arc)		Safety factor	
	X (ft)	Y (ft)	R	S
58	43	3	2 58	2.94
54	67	0.5	2 55	2.51
72	68	9	2.01	2.44
70	79	3	2.18	248
94	94	34	1.93	206
112	97	61	2.02	193
135	71	100	2 49	225
149	110	76	1 59	203
208	191	108	1.53	194
198	179	109	1 64	156
195	162	122	1 79	18[illegible]
192	128	143	2.23	182
276	163	194	1 54	199
290	233	189	1 59	1.92
405	271	291	1.41	189
515	350	389	1.54	187

NOTES

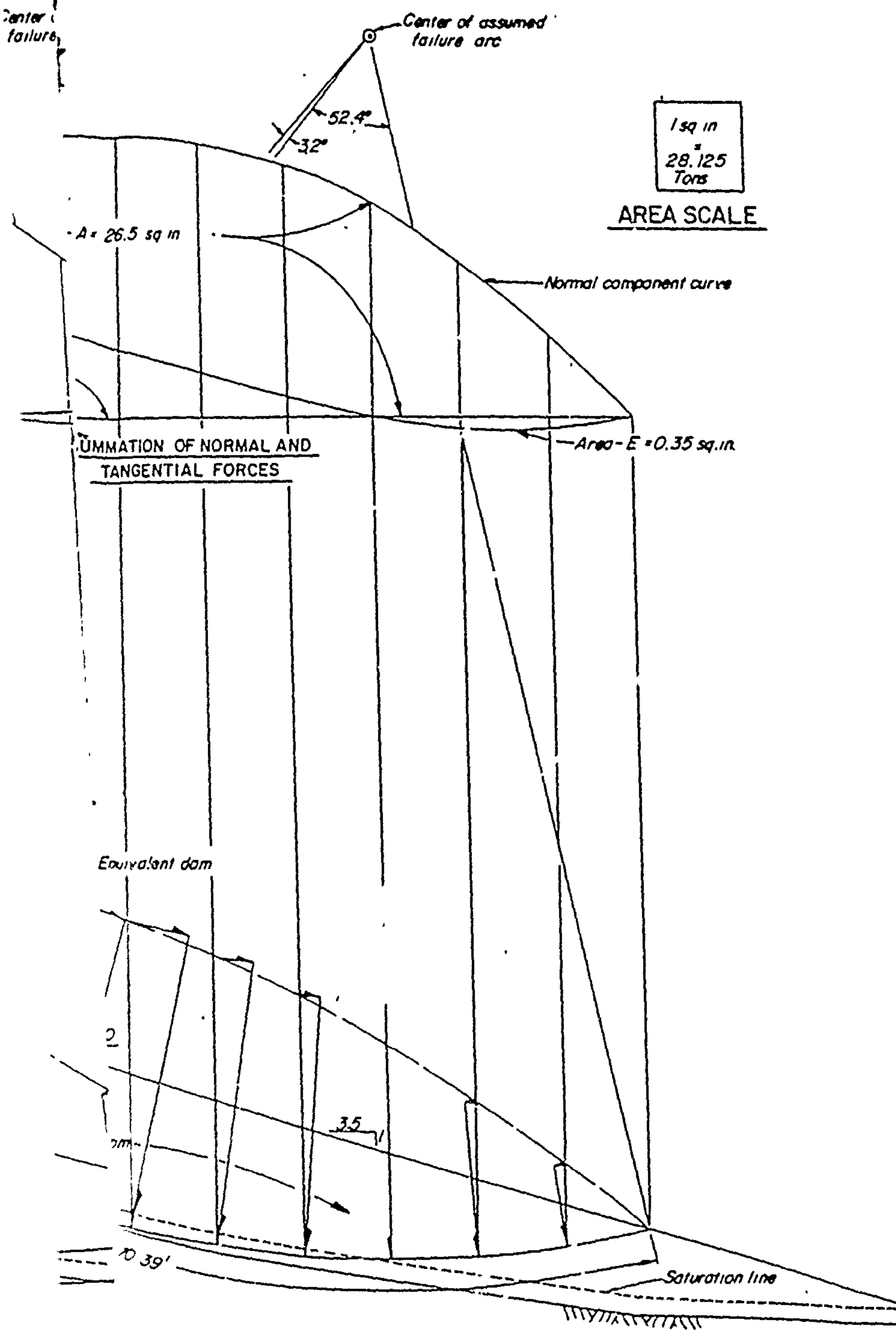
The above table i[illegible]udes results for all arcs analyzed for the steady seepage condition The coordinates represent arc centers and are referenced from the ℄ and crest of dam

STABILITY ANALYSIS OF DOWNSTREAM S

CONDITION OF STEADY SEEPAG

SCALE 1" = 30'

30' 0 30' 60'



ADOPTED DESIGN DATA					
Materials	Unitweight lbs./cu ft		Shear strengths (*)		
	Saturated	Submerged	Q	R	S
Select rock	135	72.6	ϕ=39° C=0	ϕ=39° C=0	ϕ=39° C=0
Random rock	135	72.6	ϕ=33° C=0	ϕ=33° C=0	ϕ=33° C=0
Transition mat'l	135	72.6	ϕ=33° C=0	ϕ=33° C=0	ϕ=33° C=0
Impervious	125	62.5	ϕ=10° C=0.6	ϕ=14° C=0.1	ϕ=27° C=0
Random	125	62.5	ϕ=10° C=0.4	ϕ=12° C=0.4	ϕ=29° C=0

(*) ϕ = Angle of internal friction (degrees)
C = Cohesion (Tons/ft^2)

Positive tangential force Area-D = 230 625 Tons
Negative tangential force Area-E −9 844 Tons
Σ Total = 220781 Tons

NORMAL AND RESISTING FORCES

Normal force Area ———— A = 745 313 Tons
Normal force Area ———— B = 9 844 Tons
Normal force Area ———— C = 0.844 Tons
Cohesion (LC) = (370 39x0 4)+(22 6x0 1) = 150 416 Tons

SAFETY FACTOR COMPUTATIONS

Formula

$$S.F. = \frac{\Sigma N \times Tan\ \phi + LC}{\Sigma T}$$

Consolidated undrained condition (R)

$$S.F. = \frac{745\ 313 \times Tan\ 12° + 9\ 844 \times Tan\ 14° + 0\ 844 \times Tan\ 33° + 150\ 416}{220\ 781}$$

S.F. = 1 41

Consolidated drained (s) (neglecting cohesion)

$$S.F. = \frac{745\ 313 \times Tan\ 29° + 9\ 844 \times Tan\ 27° + 0\ 844 \times Tan\ 33°}{220\ 781}$$

S.F. = 1 89

S.F. = Avg R and S = 1 65

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

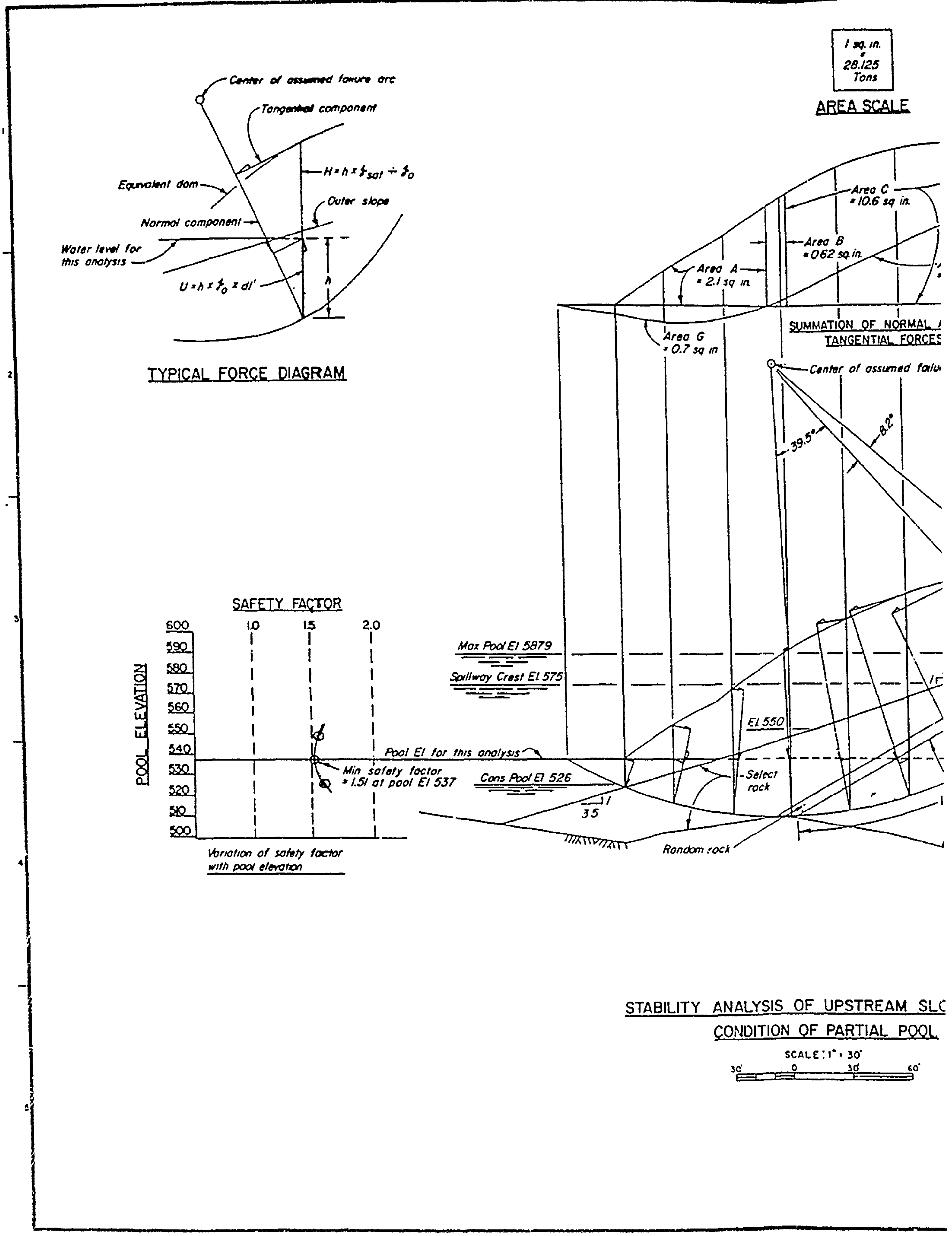
UNDER DOWNSTREAM SLOPES UNDER
STEADY SEEPAGE

SCALE 1" = 30'
30' 60'

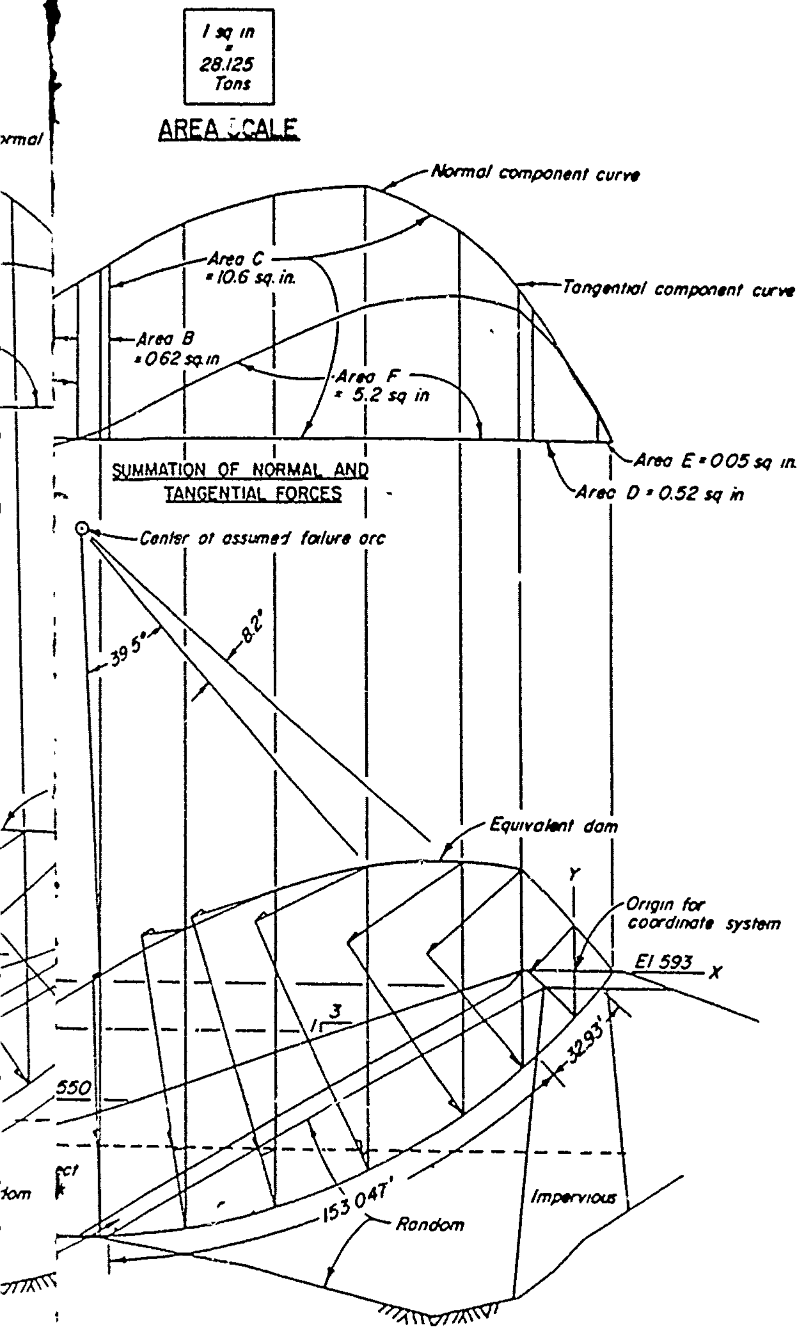
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS
DIERKS DAM AND RESERVOIR
RIGHT EMBANKMENT
DOWNSTREAM STA. 5+20
STABILITY ANALYSIS - STEADY SEEPAGE COND.

DESIGNED / DRAWN / TRACED / SUBMITTED / RECOMMENDED / APPROVED
DATE NOV 1967
SCALE AS SHOWN
DRAWING NO 1960-DM8-97/11



1 sq. in. = 28.125 Tons
AREA SCALE
Center of assumed failure arc
Tangential component
Equivalent dam
H = h x γsat ÷ γo
Outer slope
Normal component
Water level for this analysis
U = h x γo x dl'
h
TYPICAL FORCE DIAGRAM
Area C = 10.6 sq in.
Area B = 0.62 sq. in.
Area A = 2.1 sq in.
Area G = 0.7 sq in
SUMMATION OF NORMAL
TANGENTIAL FORCES
Center of assumed failu
39.5°
8.2°
SAFETY FACTOR
1.0
1.5
2.0
POOL ELEVATION
600
590
580
570
560
550
540
530
520
510
500
Min safety factor = 1.51 at pool El 537
Variation of safety factor with pool elevation
Max Pool El 587.9
Spillway Crest El. 575
El 550
Pool El for this analysis
Cons Pool El 526
Select rock
Random rock
3.5
1
STABILITY ANALYSIS OF UPSTREAM SL
CONDITION OF PARTIAL POOL
SCALE: 1" = 30'
30'
0
30'
60'



ADOPTED DESIGN DATA

Materials	Unitweight lbs./cu.ft.		Shear Strengths (*)		
	Saturated	Submerged	Q	R	S
Select rock	135	72.6	$\phi=39°$ C=0	$\phi=39°$ C=0	$\phi=39°$ C=0
Random rock	135	72.6	$\phi=33°$ C=0	$\phi=33°$ C=0	$\phi=33°$ C=0
Transition mat'l	135	72.6	$\phi=33°$ C=0	$\phi=33°$ C=0	$\phi=33°$ C=0
Impervious	125	62.5	$\phi=10°$ C=0.6	$\phi=14°$ C=0.1	$\phi=27°$ C=0
Random	125	62.5	$\phi=10°$ C=0.4	$\phi=12°$ C=0.4	$\phi=29°$ C=0

(*) ϕ = Angle of internal friction (degrees)
C = Cohesion (Tons/ft²)

FORCES ACTING ON FAILURE ARC

Positive tangential force Area____F = 146.250 Tons
Negative tangential force Area____G = -19.685 Tons
Σ Total = 126.565 Tons

NORMAL AND RESISTING FORCES

Normal force Area__________A = 59.063 Tons
Normal force Area__________B+E = 18.844 Tons
Normal force Area__________C = 298.125 Tons
Normal force Area__________D = 14.625 Tons

Cohesion (LC)
= (153.047 x 0.4) + (32.93 x 0.1)______= 64.509 Tons

SAFETY FACTOR COMPUTATIONS

Formula: $S.F. = \frac{\Sigma N \times Tan\,\phi + LC}{\Sigma T}$

For consolidated undrained (R) condition

$S.F. = \frac{59.063 \times Tan\,39° + 18.844 \times Tan\,33° + 298.125 \times Tan\,12° + 14.625 \times Tan\,14° + 64.509}{126.565}$

$SF = 1.51$

DER

IS OF UPSTREAM SLOPES UNDER
ON OF PARTIAL POOL

SCALE 1" = 30'
0 30 60

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

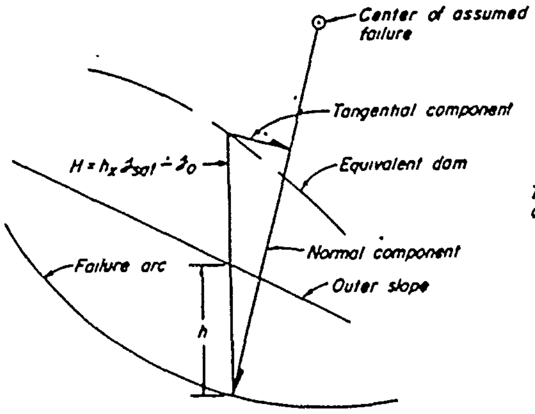
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

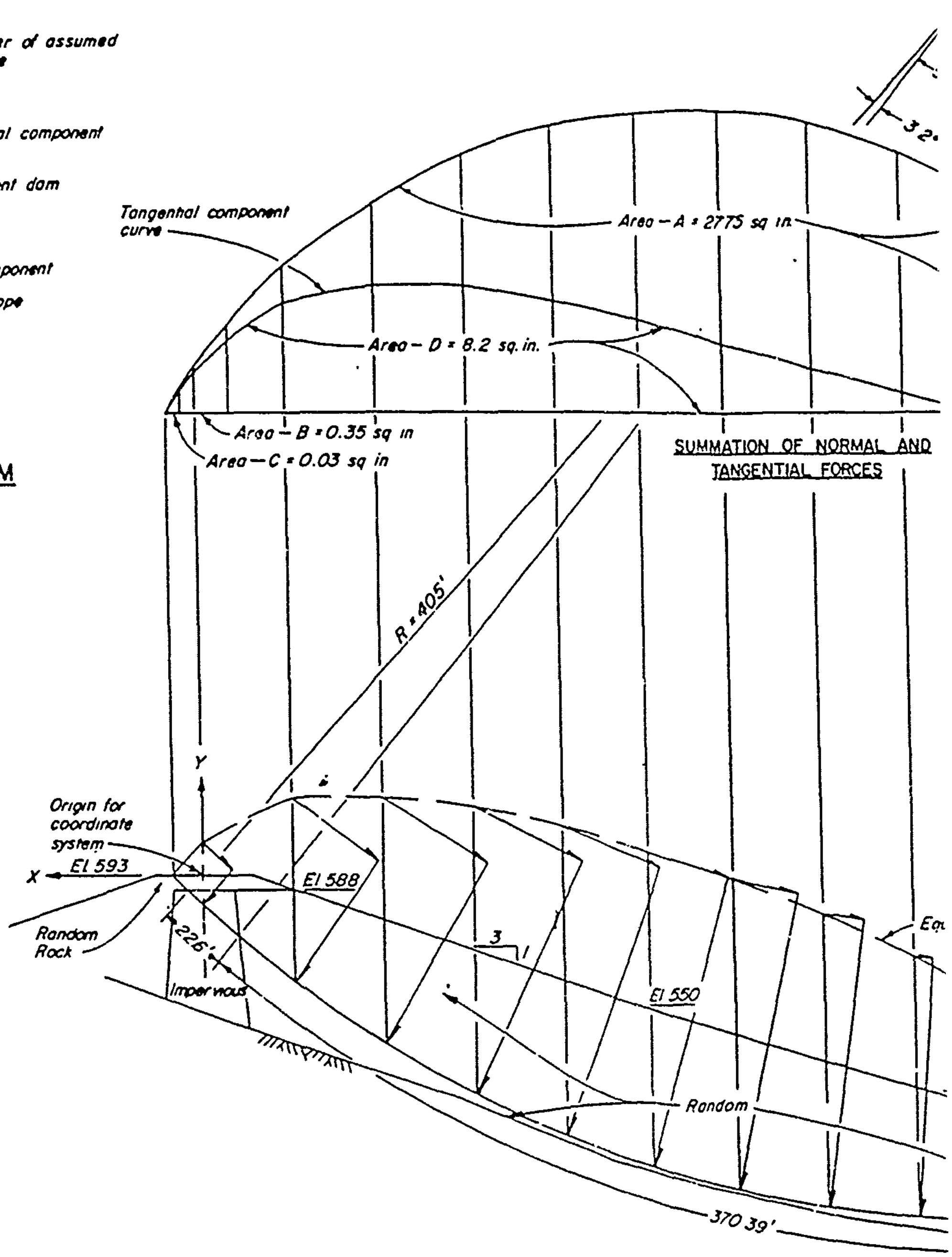
DIERKS DAM AND RESERVOIR
RIGHT EMBANKMENT
UPSTREAM STA. 2 + 50
STABILITY ANALYSIS- PARTIAL
POOL CONDITION

	BY	CHKD
DESIGNED	KT	
DRAWN	JWM	
TRACED		

SUBMITTED
CHIEF, SOILS DESIGN SEC.
RECOMMENDED
CHIEF, FND & MATLS BR.
APPROVED
CHIEF, ENGRG DIV. FOR THE DIST ENGINEER
DATE NOV. 1967
SCALE AS SHOWN
DRAWING NO 1960 - DM8 - 97/12



TYPICAL FORCE DIAGRAM



SAFETY FACTOR SUMMARY			
Radius (feet)	Coordinates (center of arc)		Safety factor
	X (ft)	Y (ft)	
58	43	3	3.13
54	67	05	2.39
72	68	9	2 26
70	79	3	2 07
94	94	34	1 83
112	97	61	1.96
135	71	100	2 76
149	110	76	1.67
208	191	108	1 42
198	179	109	1.50
195	162	122	1.67
192	128	143	2 19
276	163	194	1.50
290	233	189	1 46
405	271	231	1.36
515	350	389	1 43

Notes

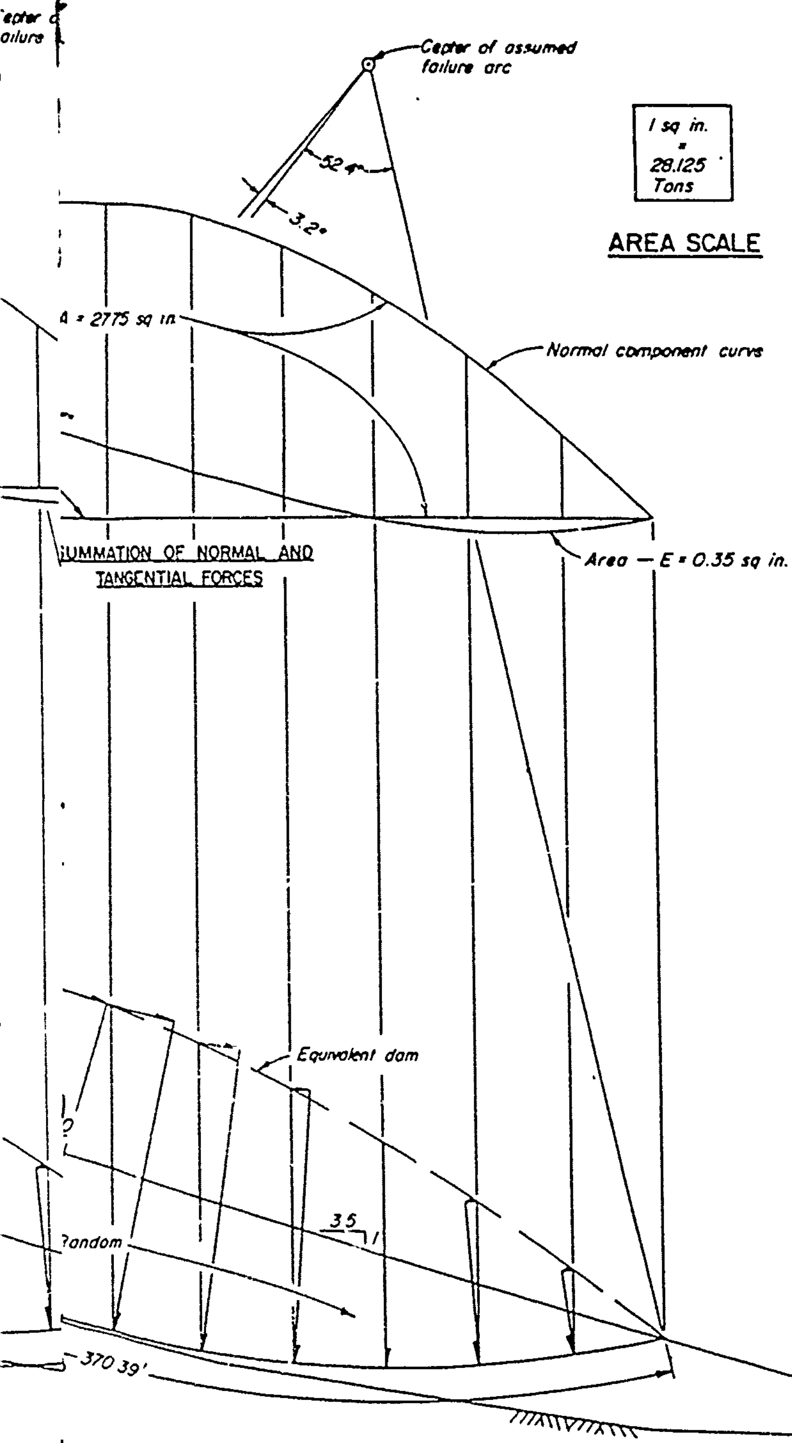
The above table includes results of all arcs analyzed for end of construction condition. Coordinates for arc centers are referenced from the ℄ and crest of the dam

STABILITY ANALYSIS OF DOWNSTREAM SL

CONDITION OF END OF CONSTRUCT

SCALE 1" = 30'

30' 0 30' 60'



ADOPTED DESIGN DATA					
Materials	Unitweight lbs / cu. ft.		Shear Strengths (*)		
	Saturated	Submerged	Q	R	S
Select rock	135	72.6	$\phi = 39°$ C = 0	$\phi = 39°$ C = 0	$\phi = 39°$ C = 0
Random rock	135	72.6	$\phi = 33°$ C = 0	$\phi = 33°$ C = 0	$\phi = 33°$ C = 0
Transition mat'l.	135	72.6	$\phi = 33°$ C = 0	$\phi = 33°$ C = 0	$\phi = 33°$ C = 0
Impervious	125	62.5	$\phi = 10°$ C = 0.6	$\phi = 14$ C = 0.1	$\phi = 27°$ C = 0
Random	125	62.5	$\phi = 10°$ C = 0.4	$\phi = 12°$ C = 0.4	$\phi = 29°$ C = 0

(*) ϕ = Angle of internal friction (degrees)
C = Cohesion (Tons/ft²)

FORCES ACTING ON FAILURE ARC

Positive tangential force Area D = 230.625 Tons
Negative tangential force Area E = − 9.844 Tons
Σ Total = 220.781 Tons

NORMAL AND RESISTING FORCES

Normal force Area________A = 780.469 Tons
Normal force Area________B = 9.844 Tons
Normal force Area________C = 0.844 Tons

Cohesion (LC) = (370.39 × 0.4) + (22.6 × 0.6) = 161.716 Tons

SAFETY FACTOR COMPUTATIONS

Unconsolidated undrained (Q) condition

$$SF = \frac{\Sigma N \times Tan\,\phi + LC}{\Sigma T}$$

$$SF = \frac{790.313 \times Tan\,10° + 0.844 \times Tan\,33° + 161.716}{220.781}$$

$$SF = \underline{1.36}$$

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT.

...DER

OF DOWNSTREAM SLOPES UNDER
F END OF CONSTRUCTION

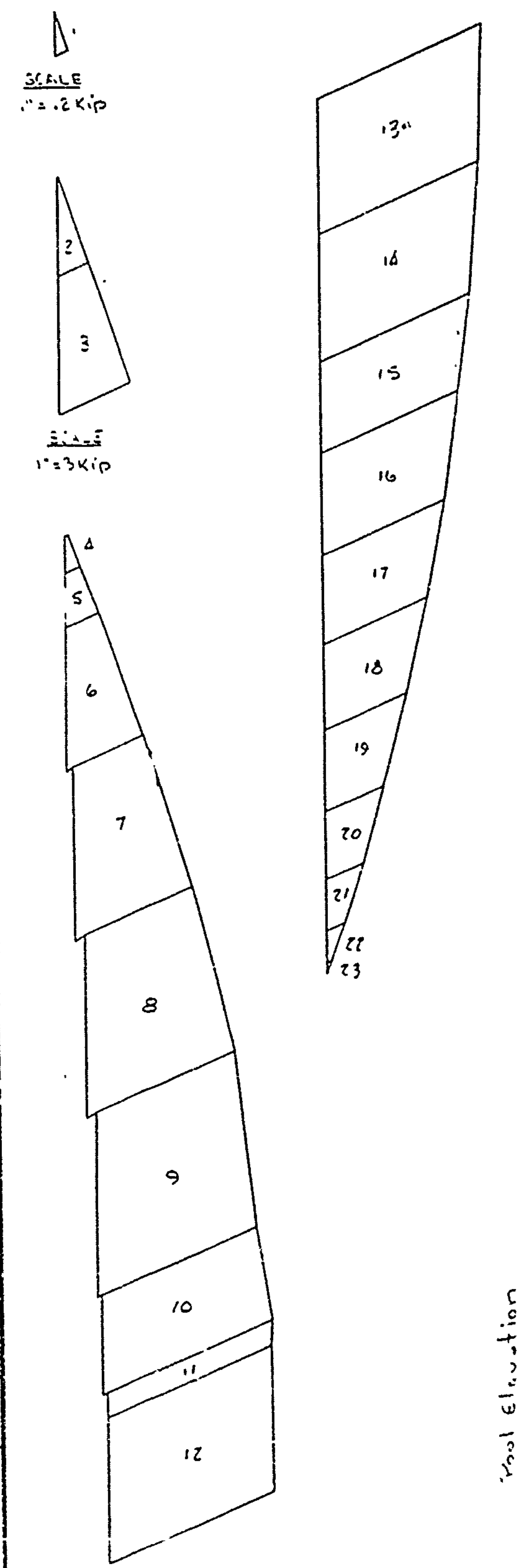
SCALE 1" = 30'
0 30 60

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

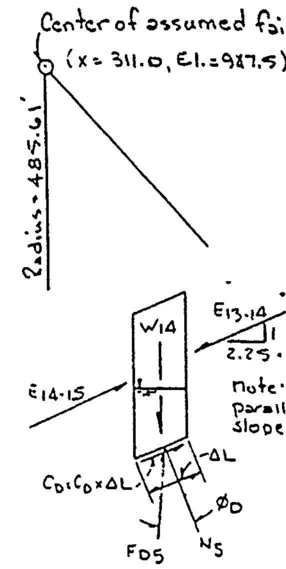
DIERKS DAM AND RESERVOIR
RIGHT EMBANKMENT
DOWNSTREAM STA. 5+20
STABILITY ANALYSIS – END OF CONSTRUCTION CONDITION

DESIGNED: KZ
DRAWN: JNM
TRACED:
SUBMITTED: CHIEF, SOIL MECH. SEC.
RECOMMENDED: CHIEF, FND & MAT'LS BR.
APPROVED: CHIEF, ENGRG DIV. FOR THE DIST ENGINEER
DATE: NOV. 1967
SCALE AS SHOWN
DRAWING NO. 1960-DM8-97/13



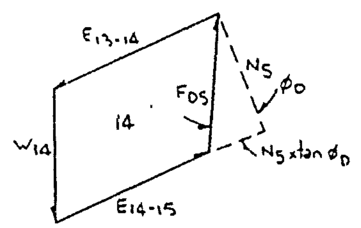
COMPOSITE FORCE POLYGON
FOR F.S. = 1.40
SCALE: 1 INCH = 50 Kips

Note: N_D was first determined using the S-Strength. If $N_D \Delta L$ was greater than the break point stress (... ksf for the impervious zone and 1.94 ksf for the Random & Transition zones) the force polygon was redrawn using the (R+S)/2 strength.



Note: All E forces act parallel to average outer slope being analyzed.

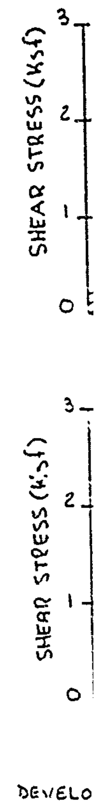
SLICE 14 WITH FORCES

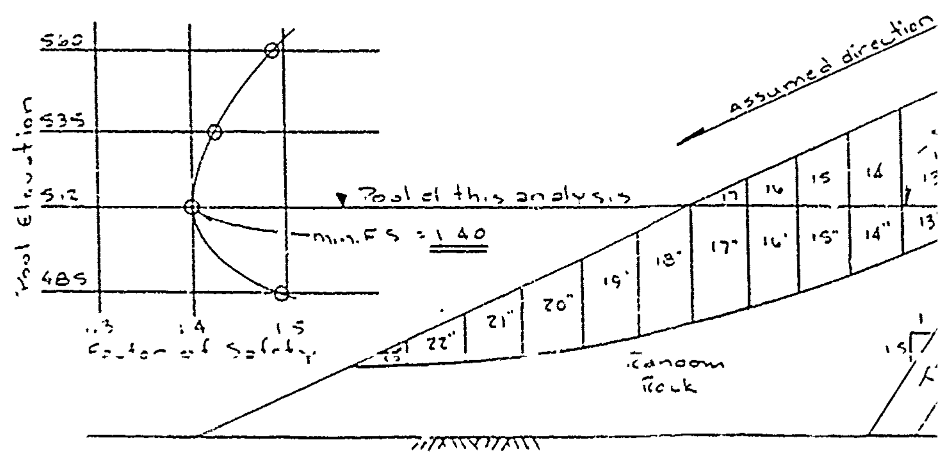


FORCE POLYGON FOR SLICE 14

LEGEND.
W : Weight of slice.
E : Earth force on side of slice.
C_D : Developed Cohesion force
F_D : Resultant of normal and developed friction force.
N : Normal to base of slice.
ΔL : Length across base of slice
ØD : Developed angle of internal friction of soil.

$C_D = \frac{c}{F.S.}$ $\quad Ø_D = \arctan \frac{\tan Ø}{F.S.}$

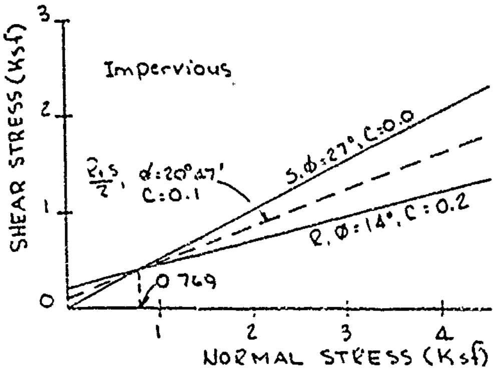


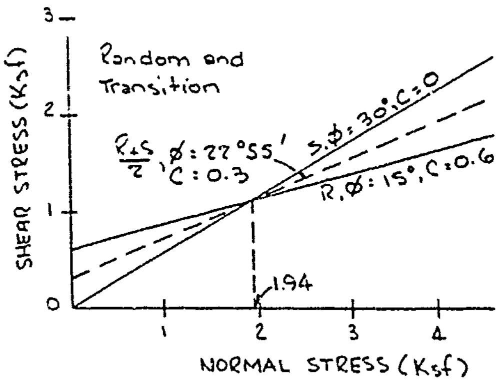


STABILITY ANALYSIS O
UNDER CONDITION OF

SCALE IN F

Arc no 13





DEVELOPED SHEAR STRENGTH FOR F.S. = 1.40

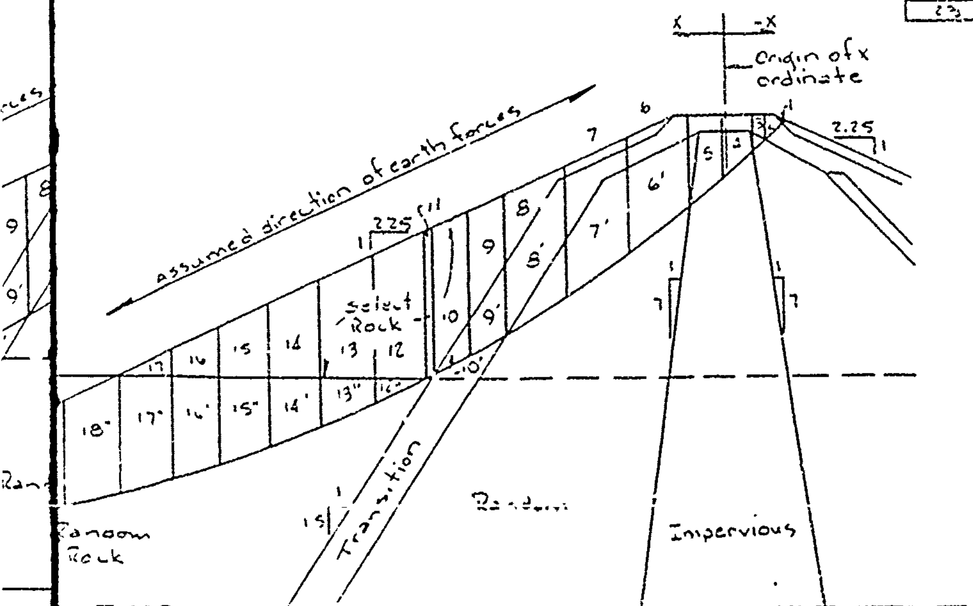
Material	Shear strength	ϕ_D	C_D (Ksf)
Random Rock	S	24.88°	0.0
Select Rock	S	30.04°	0.0
Rand & Trans	S	22.42°	0.0
	$\frac{R+S}{2}$	16.77°	0.214
Impervious	S	20.00°	0.0
	$\frac{R+S}{2}$	15.17°	0.071

ADOPTED DESIGN DATA

Material	Tan ϕ			Cohesion (Ksf)			Weight (Kcf)	
	R	S	(R+S)/2	R	S	(R+S)/2	γ sat	γ sub
Sel Rock	.8097	.8097	.8097	0.0	0.0	0.0	.1058* .135	.0726
Rand. Rock	.6494	.6494	.6494	0.0	0.0	0.0	.135	.0726
Impervious	.2493	.5095	.3794	0.2	0.0	0.1	.125	.0625
Rand & Trans	.2679	.5773	.4226	0.6	0.0	0.3	.125	.0625
Filter	.6494	.6494	.6494	0.0	0.0	0.0	.125	.0625

* Saturated surface dry wt. (40% Voids)

Slice no.	Area ft²	wt. Sat. .105 Kip	wt. Sat. .125 Kip	wt Sub .0726 Kip	Total wt Kips	Base Length ΔL	Cohesion $C_D \Delta L$
1	0.3	0.1	-	-	0.1	1.3	0.0
2	27.0	-	3.3	-	3.3	7.7	0.0
3	36.0	-	4.5	-	4.5	3.1	0.0
4	153.0	-	19.1	-	19.1	3.1	0.9
5	234.0	-	29.3	-	29.3	12.9	0.9
6	40.5	4.2	-	-	78.0	-	-
6'	590.4	-	73.8	-		24.8	5.3
7	60.3	6.3	-	-	93.0	-	-
7'	693.6	-	86.7	-		24.0	5.1
8	225.0	23.6	-	-	98.8	-	-
8'	601.6	-	75.2	-		23.2	5.0
9	288.6	30.3	-	-	55.1	-	-
9'	198.0	-	24.8	-		12.8	2.7
10	450.0	47.3	-	-	53.9	-	-
10'	52.9	-	6.6	-		12.6	2.7
11	126.0	13.2	-	-	13.2	3.1	0.0
12	693.0	72.8	-	-	78.1	-	-
12"	73.5	-	-	5.34		18.8	0.0
13	558.3	58.7	-	-	73.1	-	-
13'	198.0	-	-	14.4		18.5	0.0
14	459.0	48.2	-	-	68.9	-	-
14"	271.7	-	-	20.7		18.2	0.0
15	315.0	33.1	-	-	49.2	-	-
15"	374.0	-	-	28.5		18.0	0.0
16	189.0	19.85	-	-	54.5	-	-
16"	454.1	-	-	34.6		17.7	0.0
17	81.0	8.5	-	-	47.4	-	-
17"	510.5	-	-	38.9		17.6	0.0
18"	639.0	-	-	46.4	46.4	19.2	0.0
19"	576.0	-	-	43.9	43.9	19.1	0.0
20"	477.0	-	-	36.3	36.3	19.0	0.0
21"	360.0	-	-	27.4	27.4	16.9	0.0
22	225.0	-	-	17.1	17.1	16.8	0.0
23	81.0	-	-	6.2	6.2	16.8	0.0



STABILITY ANALYSIS OF UPSTREAM SLOPE
UNDER CONDITION OF PARTIAL POOL

SCALE IN FEET

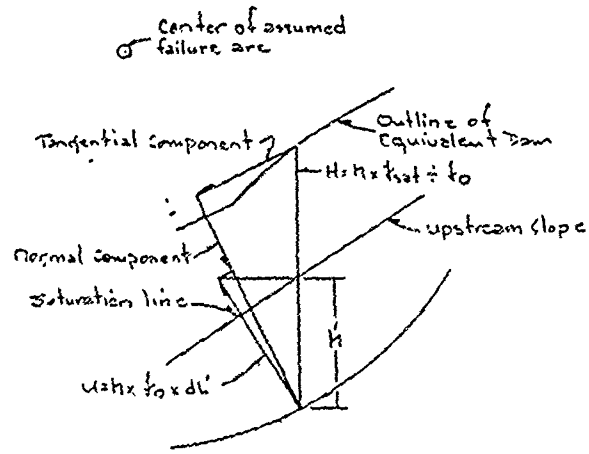
THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

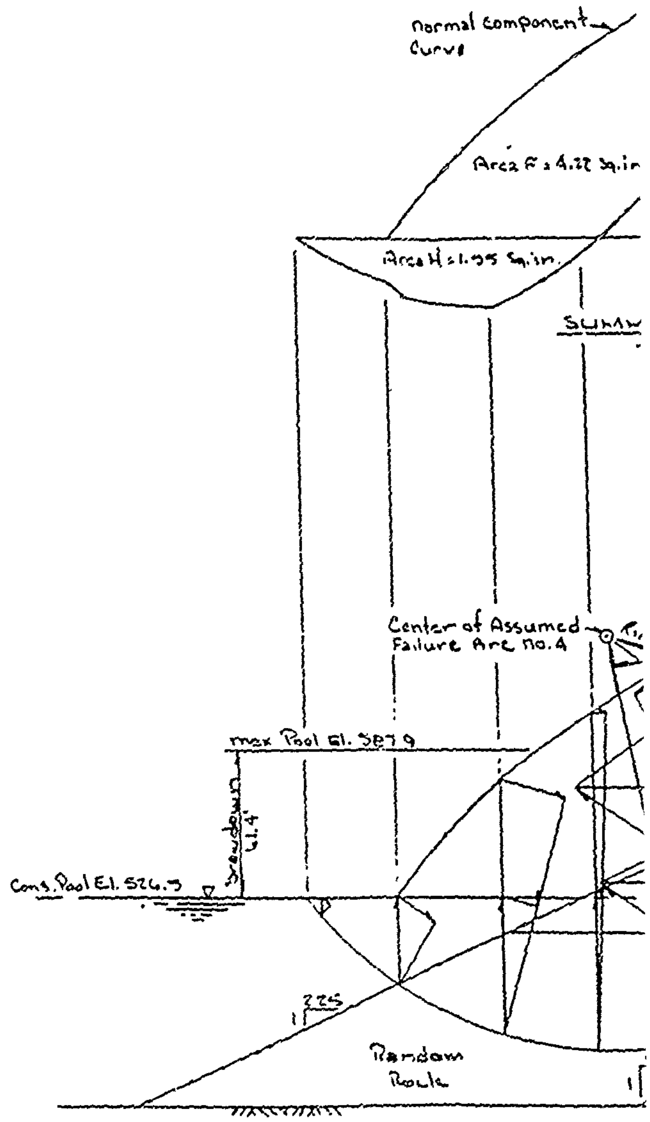
DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
STABILITY ANALYSIS
PARTIAL POOL

DESIGNED BY K. Eland
DRAWN BY K. Eland
CHECKED BY K. Baker
SUBMITTED Ch. Soils Mech Sec
DATE DEC 1972
SCALE AS SHOWN — TO ACCOMPANY SUPPLEMENT NO. 2
DRAWING NO 1960-DM8-97/12



TYPICAL FORCE DIAGRAM

SAFETY FACTOR SUMMARY				
ARC NO	RADIUS (FEET)	COORDINATES (CENTER OF ARC)		SAFETY FACTOR
		X (FT)	Y (FT)	
1	335.8	-262.0	184.0	1.12
2.	509.2	-348.5	358.0	1.22
3	217.5	-186.5	65.5	1.06
4	171.5	-154.0	82.0	1.03
5	485.6	-311.0	354.5	1.16
6	276.2	-252.0	128.0	1.26
7	356.1	-238.5	238.0	1.08
8	216.0	-181.0	111.5	1.10

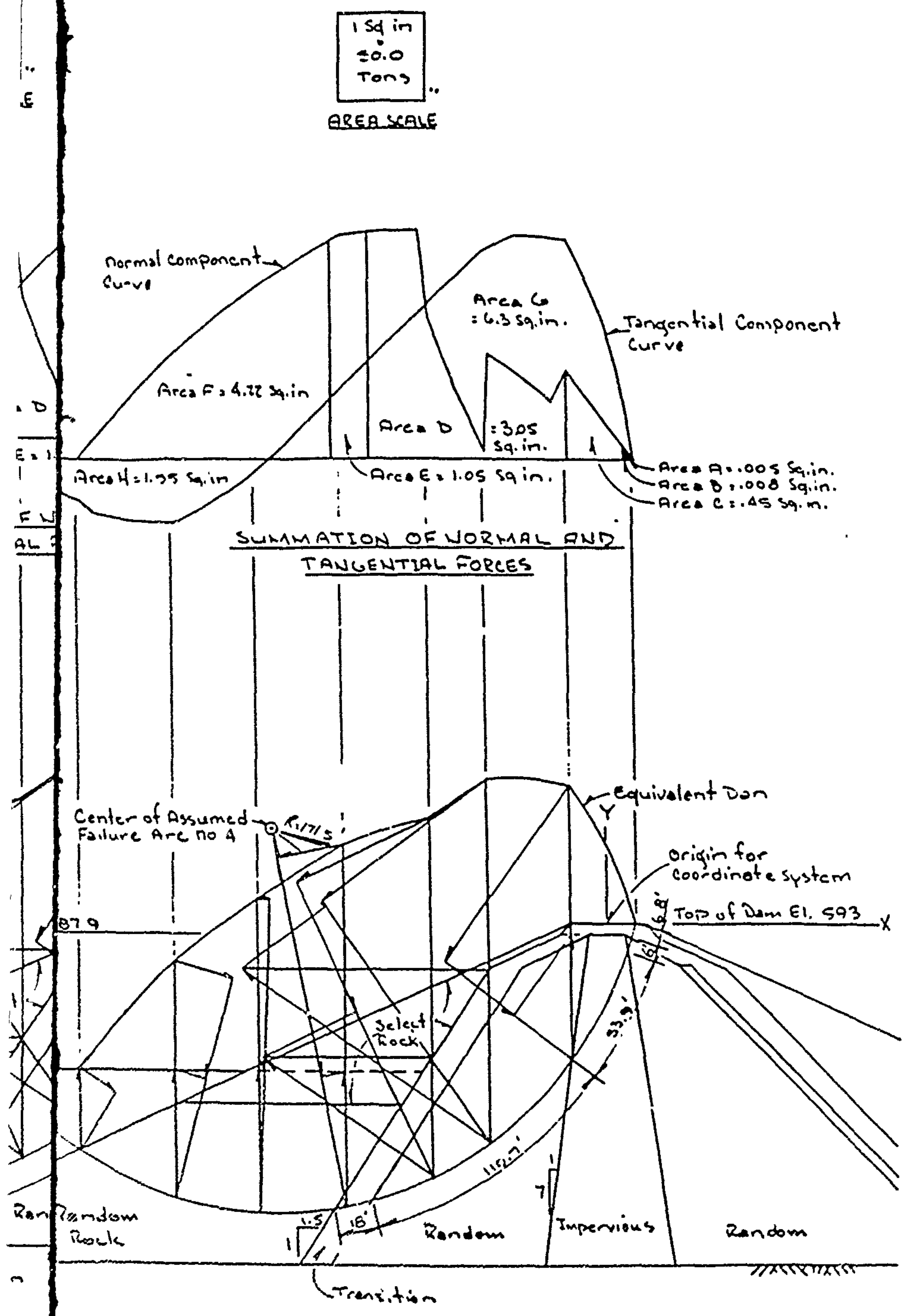


STABILITY ANALYSIS OF UPSTREA

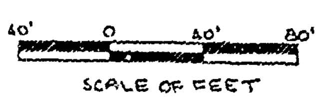
SUDDEN D

40' 0

SCALE



ANALYSIS OF UPSTREAM SLOPE UNDER CONDITION OF SUDDEN DRAWDOWN



ADOPTED DESIGN DATA				
materials	Soil wts. Lbs/ft³		Shear Strengths	
	Saturated	Submerged	*	R
Select Rock	105** 135	72.6	Ø C	39 0
Random Rock	135	72.6	Ø C	33 0
Random	125	62.5	Ø C	.5 0.3
Impervious	125	62.5	Ø C	14 0.1
Transition	125	62.5	Ø C	15 0.3

* Ø: Angle of internal friction (degrees)
C: Cohesion (Tons/ft²)
** Saturated surface dry wt (40% Voids)

FORCES ACTING ON FAILURE ARC

Positive tangential force Area G = 315.00 Ton
Negative tangential force Area H = -77.50 Ton
Σ Total = 237.50 Ton

NORMAL AND RESISTING FORCES

normal force Area A = 0.25 Ton
normal force Area B = 0.40 Ton
normal force Area C = 22.50 Ton
normal force Area D = 152.50 Ton
normal force Area E = 52.50 Ton
normal force Area F = 211.00 Ton

Cohesion ΣC

141.5' x 0.3 = 42.45 Ton
53.9' x 0.1 = 5.39 Ton

SAFETY FACTOR COMPUTATIONS

Formula: $S.F. = \frac{\Sigma N \times \tan\phi + \Sigma C}{\Sigma T}$

For Consolidated Undrained (R)

$S.F. = \frac{(211.00 \times \tan 33°) + (205.65 \times \tan 15°) + (22.5 \times \tan 14°) + 47.84}{237.5}$

$= \frac{245.56}{237.5}$

$= 1.03$

NOTES:
The sudden drawdown condition was analyzed using the methods outlined in EM 1110-2-1902 Dec 1960. The computer program utilizing EM 1110-2-1902 April 1970 does not provide for the multiple Select Rock weights.

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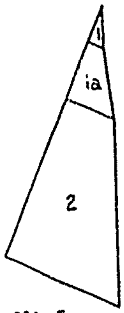
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

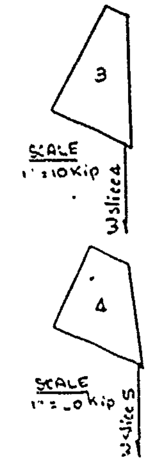
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

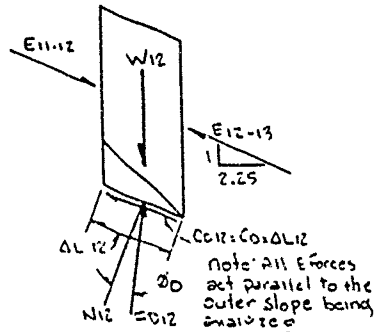
DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
STABILITY ANALYSIS
SUDDEN DRAWDOWN

DESIGNED BY: K. Leland
DRAWN BY: K. Leland
CHECKED BY: L. Barber
SUBMITTED: CHIEF, SOILS MECH. SEC.
DEC 1972
SCALE AS SHOWN
TO ACCOMPANY SUPPLEMENT NO. 8
DRAWING NO. 1960-DM8-97/15

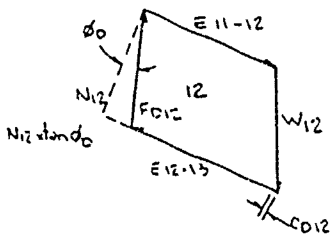


SCALE
1"=2 KIP





SLICE 12 WITH FORCES

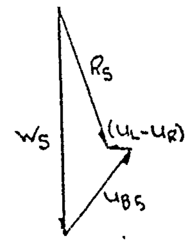


FORCE POLYGON FOR SLICE 12

LEGEND:
- W = Weight of slice.
- E = Earth force on side of slice.
- FD: Resultant of normal and developed frictional force
- N = Normal to base of slice.
- ΔL = Length across base of slice
- ØD = Developed angle of internal friction of soil.

$C_D = \frac{C}{F.S.}$ $\quad \Phi_D = \arctan \frac{\tan\phi}{F.S.}$

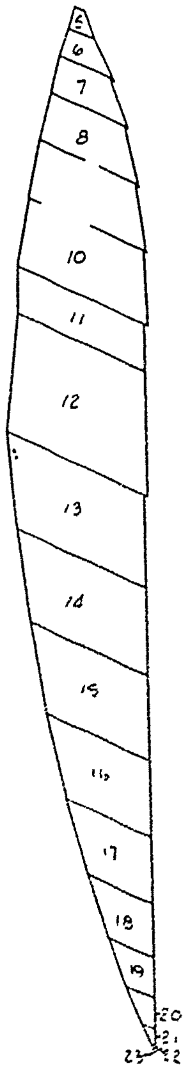
RESULTANTS OF WEIGHT AND WATER FORCE OF SLICES				
SLICE no.	U, Left (Kips)	U, Right (Kips)	U, Base (Kips)	Resultant (Kips)
1a	0.0	0.3	0.7	1.5
2	0.3	1.5	1.8	3.9
3	1.5	8.8	10.6	14.0
4	8.8	18.2	17.9	21.8
5	18.2	26.4	36.4	46.0
6	26.4	22.1	36.7	67.0
7	22.1	14.3	30.6	79.0
8	14.3	7.3	22.7	93.0
9	7.3	2.0	12.1	105.0
10	2.0	0.0	4.8	117.0



WATER FORCES FOR SLICE 5

SCALE
1" = 30 Kip

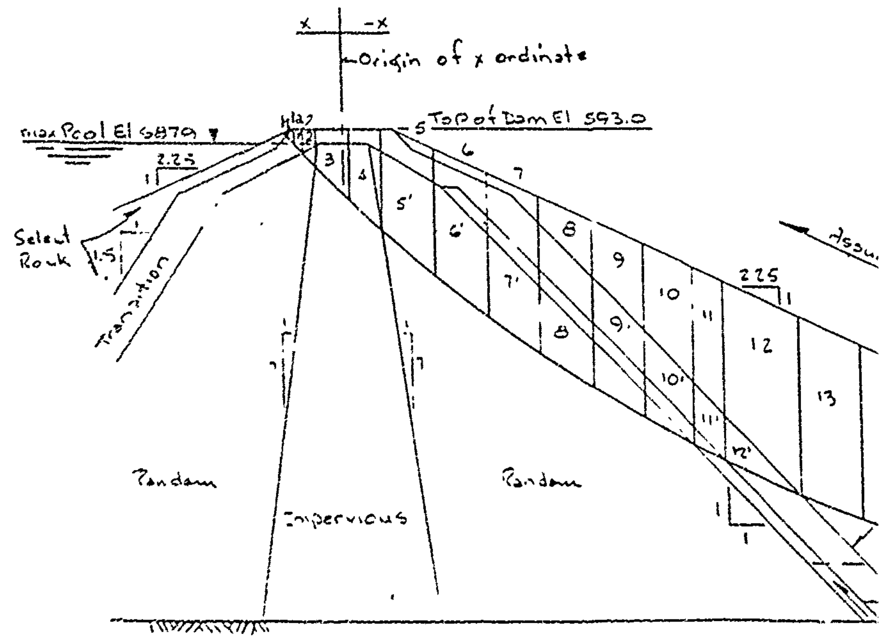
LEGEND:
- UL: Hydrostatic force on left side o
- UR: Hydrostatic force on right side o
- UB: Hydrostatic uplift force normal to of slice
- R: Resultant of weight and hydrost on slice



COMPOSITE FORCE POLYGON FOR FS = 1.37

SCALE: 1 INCH = 190 Kips

Note: No was first determined using the S-Strength. If No/ΔL was greater than the break point stress, 0.769 ksf for the impervious zone and 1.04 ksf for the Random & Transition Zones the force polygon was redrawn using the $\frac{R+S}{2}$ Strength.



STABILITY ANALYSIS OF DOWNSTREAM SLO

STEADY SEEPAGE

30 0 30

SCALE IN FT.

WEIGHT AND SLICES	
U. Base (Kips)	Resultant (Kips)
0.7	1.5
1.8	3.9
10.6	14.0
17.9	21.8
36.4	46.0
36.7	67.0
30.6	79.0
22.7	93.0
14.1	105.0
4.8	117.0

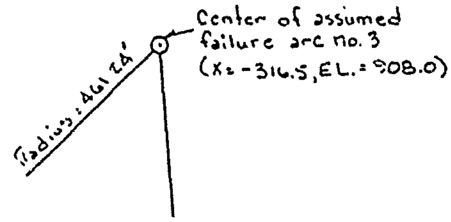
(UL-UR)

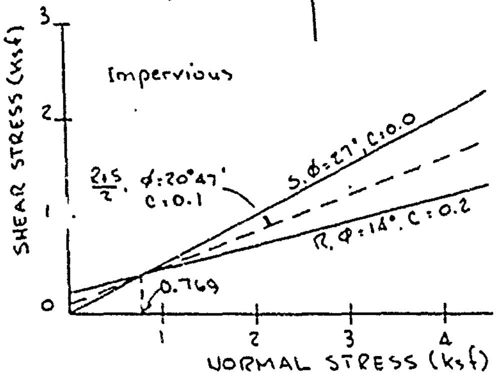
UBS

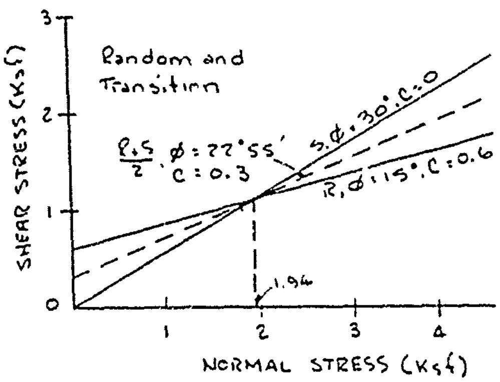
CES

S

Force on left side of slice
Force on right side of slice
Uplift force normal to base
Weight and hydrostatic force







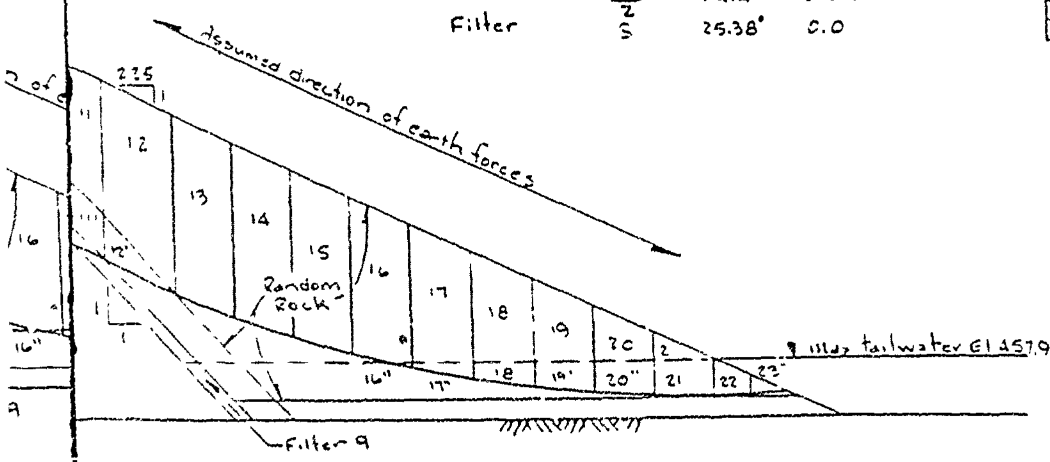
DEVELOPED SHEAR STRENGTHS FOR F.S. =1.37

material	Shear strength	ϕ_D	C_D
Random Rock	S	25.38°	0.0
Impervious	$\frac{R+S}{2}$	15.5°	0.073
Rand.+Trans	S	22.86°	0.0
	$\frac{R+S}{2}$	17.14°	0.219
Filter	S	25.38°	0.0

ADOPTED DESIGN DATA								
Material	Tan φ			Cohesion (ksf)			Weight (Kcf)	
	R	S	(R+S)/2	R	S	(R+S)/2	γsat.*	γsub
Sel. Rock	.8097	.8097	.8097	0.0	0.0	0.0	.135	.0726
Rand. Rock	.6494	.6494	.6494	0.0	0.0	0.0	.135	.0726
Impervious	.2493	.5095	.3794	0.2	0.0	0.1	.125	.0625
Rand+Trans	.2679	.5773	.4226	0.6	0.0	0.3	.125	.0625
Filter	.6494	.6494	.6494	0.0	0.0	0.0	.125	.0625

* Saturated surface dry wt (40% voids)

Slice no.	Area (Ft²)	wt Sat. 135 KCF	wt. Sat 125 KCF	wt. Sub .0726 KCF	Total wt KCF	Base length ΔL (ft)	Cohesion C×ΔL
1	6.75	-	.84	-	2.8	4.4	0
1a	15.75	-	1.96	-		4.2	0
2	40.5	-	5.1	-	5.1	6.0	0
3	171.0	-	21.4	-	21.4	14.4	1.05
4	279.0	-	34.8	-	34.8	14.0	1.03
5	27.0	3.6	-	-	74.5	-	-
5'	567.0	-	70.9	-		21.9	0
6	54.0	7.3	-	-	89.4	-	-
6'	657.0	-	82.1	-		21.1	4.6
7	67.5	9.1	-	-	99.9	-	-
7'	726.4	-	90.8	-		20.4	4.4
8	216.0	29.1	-	-	108.9	-	-
8'	639.0	-	79.8	-		19.8	4.3
9	378.0	51.0	-	-	115.8	-	-
9'	518.4	-	64.8	-		19.3	4.2
10	531.0	71.7	-	-	[illegible]	-	-
10'	396.0	-	49.5	-		18.9	4.1
11	396.0	49.5	-	-	72.0	-	-
11'	180.0	-	22.5	-		11.8	0
12	1260.0	170.1	-	-	192.6	-	-
12'	180.0	-	22.5	-		22.0	5.9
13	1053.0	142.1	-	-	142	20.4	0
14	1008.0	136.1	-	-	136.1	20.1	0
15	963.0	130.0	-	-	130.0	19.8	0
16	873.0	117.8	-	-	118.1	-	-
16"	4.5	-	-	0.3		19.6	0
17	720.0	97.2	-	-	102.9	-	-
17"	72.0	-	-	5.7		9.4	0
18	585.0	78.9	-	-	87.4	-	-
18"	117.0	-	-	8.5		19.3	0
19	405.0	54.7	-	-	67.2	-	-
19"	180.0	-	-	13.1		19.2	0
20	252.0	34.0	-	-	48.4	-	-
20"	198.0	-	-	14.4		9.1	0
21	90.0	12.2	-	-	26.6	-	-
21"	216.0	-	-	15.7		19.1	0
22"	99.0	-	-	7.2	7.2	11.7	0
23"	27.0	-	-	2.0	2.0	11.7	0



STREAM SLOPE UNDER CONDITION OF

Y SEEPAGE

0 30 60

SCALE IN FT

SAFETY FACTOR SUMMARY

Arc no	Radius (Ft)	Coordinates (Center of Arc) X (Ft)	Y (EL MSL)	Safety Factor
1	201.40	-184.50	649.50	1.69
2	358.83	-737.50	755.50	1.40
3	461.24	-316.50	908.00	1.37
4	493.80	-303.50	942.00	1.43
5	358.53	-260.50	806.00	1.37
6	179.34	-154.50	644.50	1.75
7	295.30	-188.00	797.50	1.32
8	260.93	-235.00	713.00	1.53

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

U S ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

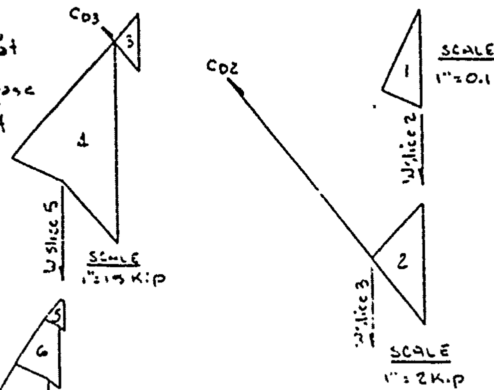
DESIGNED BY K. Leland
DRAWN BY K. Leland
CHECKED BY [illegible]
SUBMITTED [illegible]
CHIEF, SOILS MECH SEC
DATE DEC 1977

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
STABILITY ANALYSIS
STEADY SEEPAGE

SCALE AS SHOWN — TO ACCOMPANY SUPPLEMENT NO. 2
DRAWING NO. 1960-DM8-97/16

note: For slice 2 & 3, it was assumed that the developed shear resistance on the base of the slices cannot be greater than that required to close the force polygon.

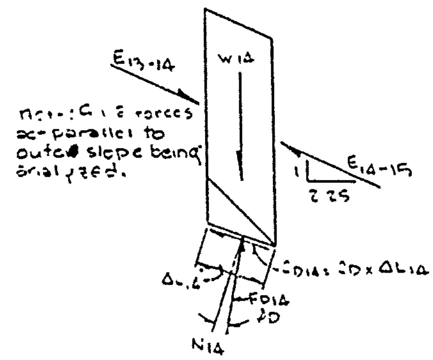


ADOPTED DESIGN DA			
Material	Q Strength		
	$\phi°$	tan ϕ	C(ts
Select Rock	39	.8097	0.(
Random Rock	25	.4663	0.4
Random & Trans.	12	.2125	0.6
Impervious	10	.1763	0.(
Filter	33	.6494	0

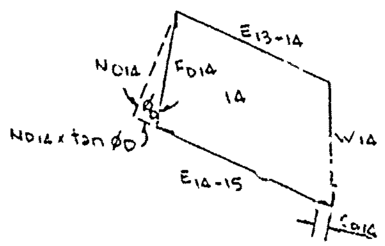
* Saturated surface dry wt. (40%

DEVELOPED SHEAR STRENG

material	ϕ	ϕ_D
Select Rock	39°	27.02°
Random Rock	25°	16.37°
Random & Trans.	12°	7.62°
Impervious	10°	6.34°
Filter	33°	22.25°



SLICE 14 WITH FORCES

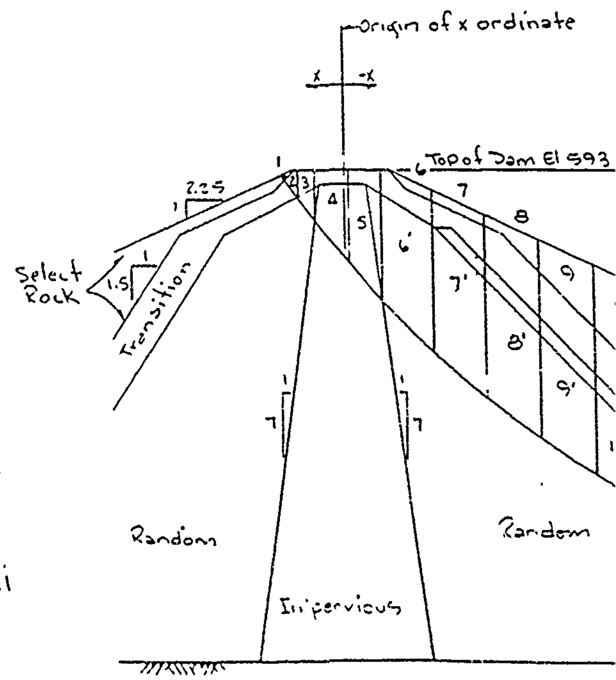


FORCE POLYGON FOR SLICE 14

LEGEND:

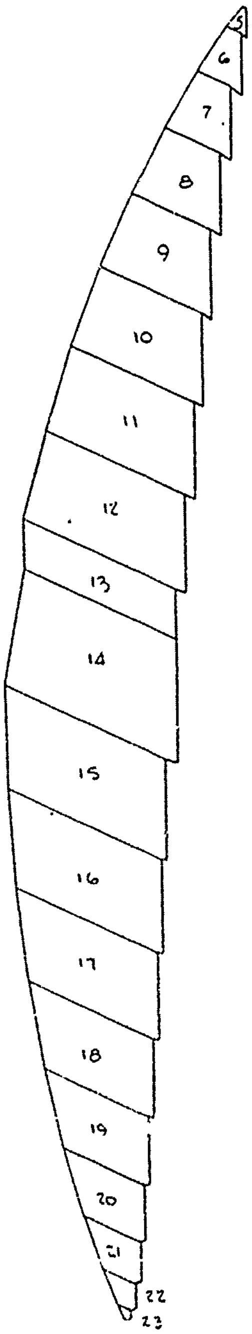
W = Weight of slice.
E = Earth force on side of slice.
C_D = Developed cohesion force.
F_D = Resultant of normal and developed friction force.
N = Normal to base of slice.
ΔL = Length across base of slice.
ϕ_D = Developed angle of internal friction of soil

$C_D = \frac{C}{F.S}$ $\phi_D = \arctan \frac{\tan \phi}{F.S}$



STABILITY ANALYSIS OF

CONDITION OF EN



COMPOSITE FORCE POLYGON FOR F.S. = 1.58

SCALE: 1 inch = 150 Kips

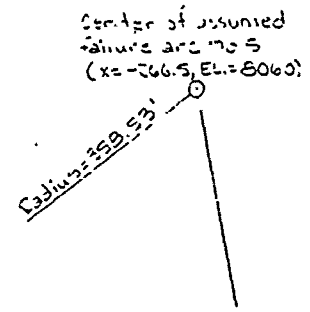
ADOPTED DESIGN DATA

	Q Strength			Unit Wt. (PCF)	
	∅°	tan ∅	C(tsf)	Sat.	Sub.
[illegible]	39	.8097	0.0	135*	72.6
[illegible]	25	.4663	0.4	135	72.6
[illegible]	12	.2125	0.8	125	62.5
	10	.1763	0.6	125	62.5
	33	.6494	0.0	125	62.5

* Surface dry wt. (40% Voids)

DEVELOPED SHEAR STRENGTHS FOR F.S.=1.58

	∅	$∅_D$	C	C_D
	39°	27.02°	0	0
[illegible]	25°	16.37°	0.8 ksf	.504 ksf
[illegible]	12°	7.62°	1.6 Ksf	1.008 Ksf
	10°	6.34°	1.2 Ksf	.756 Ksf
	33°	22.25°	0	0

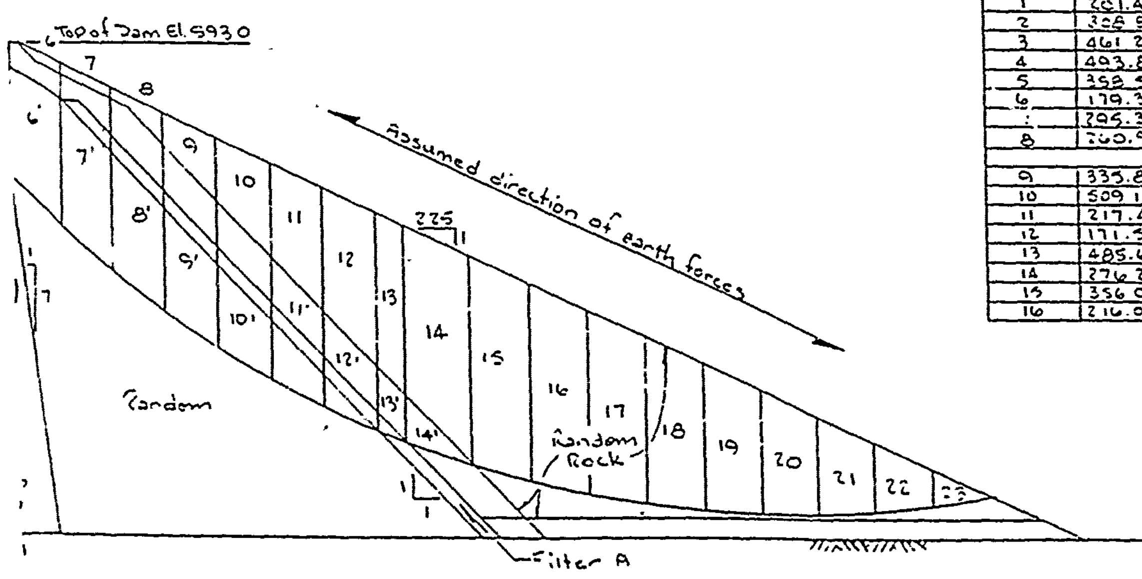


Slice no.	Area (Ft.²)	Weight (Kips) 135 lb. Sat.	Weight (Kips) 125 lb. Sat.	Total Weight (Kips)	Base Length ΔL (Ft.)	C × ΔL (Kips)
1	[illegible]	0.1	-	0.1	1.8	-
2	18.0	-	2.3	2.3	6.5	2.6
3	72.0	-	9.0	9.0	9.3	3.3
4	252.0	-	31.5	31.5	[illegible]	[illegible]
5	396.0	-	49.5	49.5	16.4	12.4
6	36.0	4.9	-	[illegible]	-	-
6'	[illegible]	-	93.4		[illegible]	33.6
7	54.0	[illegible]	-	[illegible]	-	-
7'	873.0	-	109.1		22.3	22.3
8	99.0	13.4	-	[illegible]	-	-
8'	[illegible]		115.0		21.3	21.3
9	[illegible]	36.5	-	[illegible]	-	-
9'	828.0	-	103.5		20.5	20.5
10	435.0	58.5	-	[illegible]	-	-
10'	711.0	-	88.9		10.8	10.8
11	556.0	75.3	-	[illegible]	-	-
11'	612.0	-	[illegible]		19.3	19.3
12	729.0	98.4	-	[illegible]	-	-
12'	441.0	-	55.1		18.8	8.8
13	452.0	60.8	-	77.6	-	-
13'	135.0	-	16.8		9.5	3
14	1287.0	173.7	-	[illegible]	-	-
14'	135.0	-	16.8		22.0	22.0
15	1170	157.9	-	157.9	6.1	[illegible]
16	1098.0	148.2	-	148.2	18.9	9.5
17	1008.0	136.1	-	136.1	18.7	9.4
18	900.0	121.5	-	121.5	18.6	5.6
19	774.0	104.5	-	104.5	8.5	3.3
20	639.0	86.2	-	86.2	18.5	9.3
21	477.0	64.4	-	64.4	18.5	9.3
22	297.0	40.1	-	40.1	18.5	9.3
23	99.0	13.4	-	13.4	18.7	9.4

SAFETY FACTOR SUMMARY

Arc no.	Radius (Ft.)	Coordinates (Center of Arc) X (Ft)	Coordinates (Center of Arc) Y (EL MSL)	Safety Factor
DOWNSTREAM				
1	301.40	-184.50	649.00	1.90
2	358.93	-237.50	755.50	1.60
3	461.24	-316.50	908.00	1.61
4	493.80	-343.50	942.00	1.72
5	358.53	-266.50	806.00	1.58
6	179.34	-154.50	644.50	2.01
7	295.30	-188.00	797.00	1.92
8	260.93	-235.00	713.00	1.72
UPSTREAM				
9	335.82	262.00	777.00	1.71
10	509.17	348.50	951.00	1.76
11	217.48	186.50	658.50	2.02
12	171.52	154.00	635.00	2.21
13	485.61	311.00	947.50	1.83
14	276.24	252.00	721.00	1.60
15	356.09	238.50	831.00	1.83
16	216.04	181.00	704.50	2.03

Origin of x ordinate



ANALYSIS OF DOWNSTREAM SLOPE UNDER CONDITION OF END OF CONSTRUCTION

30 0 30 60

SCALE IN FT

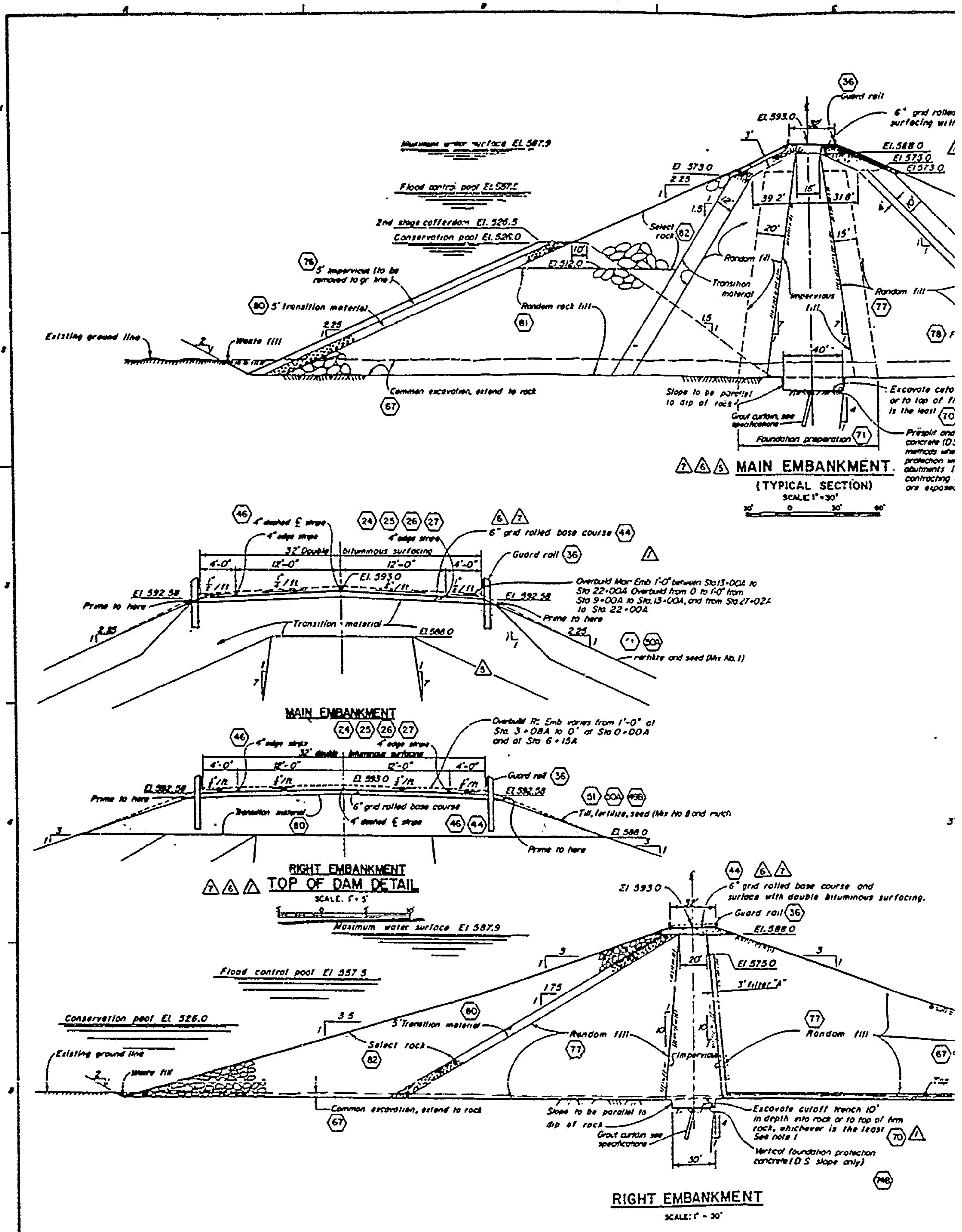
THIS DRAWING WAS ORIGINALLY PREPARED FOR USE IN A DESIGN MEMORANDUM AND WAS REPRODUCED FOR USE IN THIS REPORT

U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

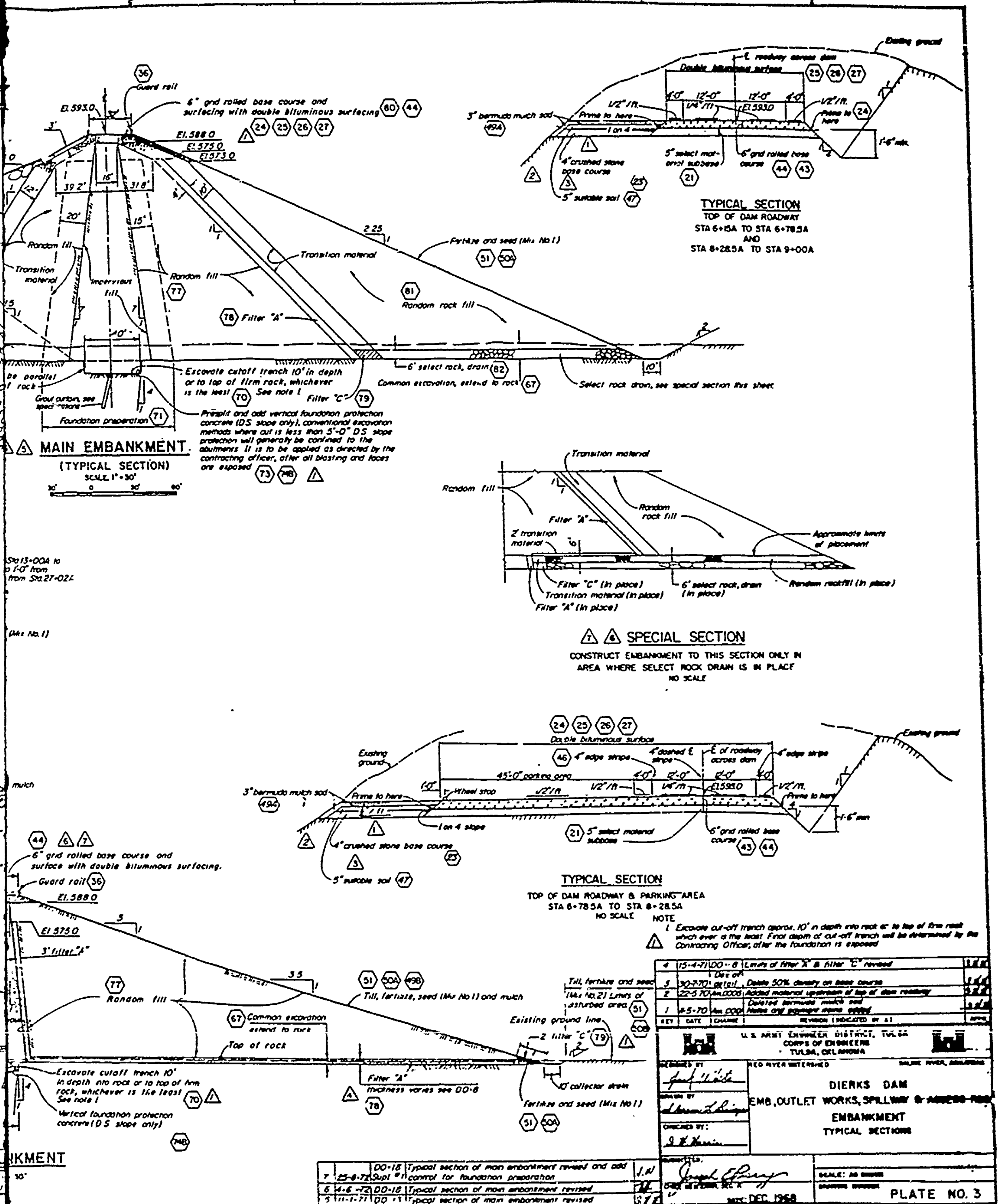
RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

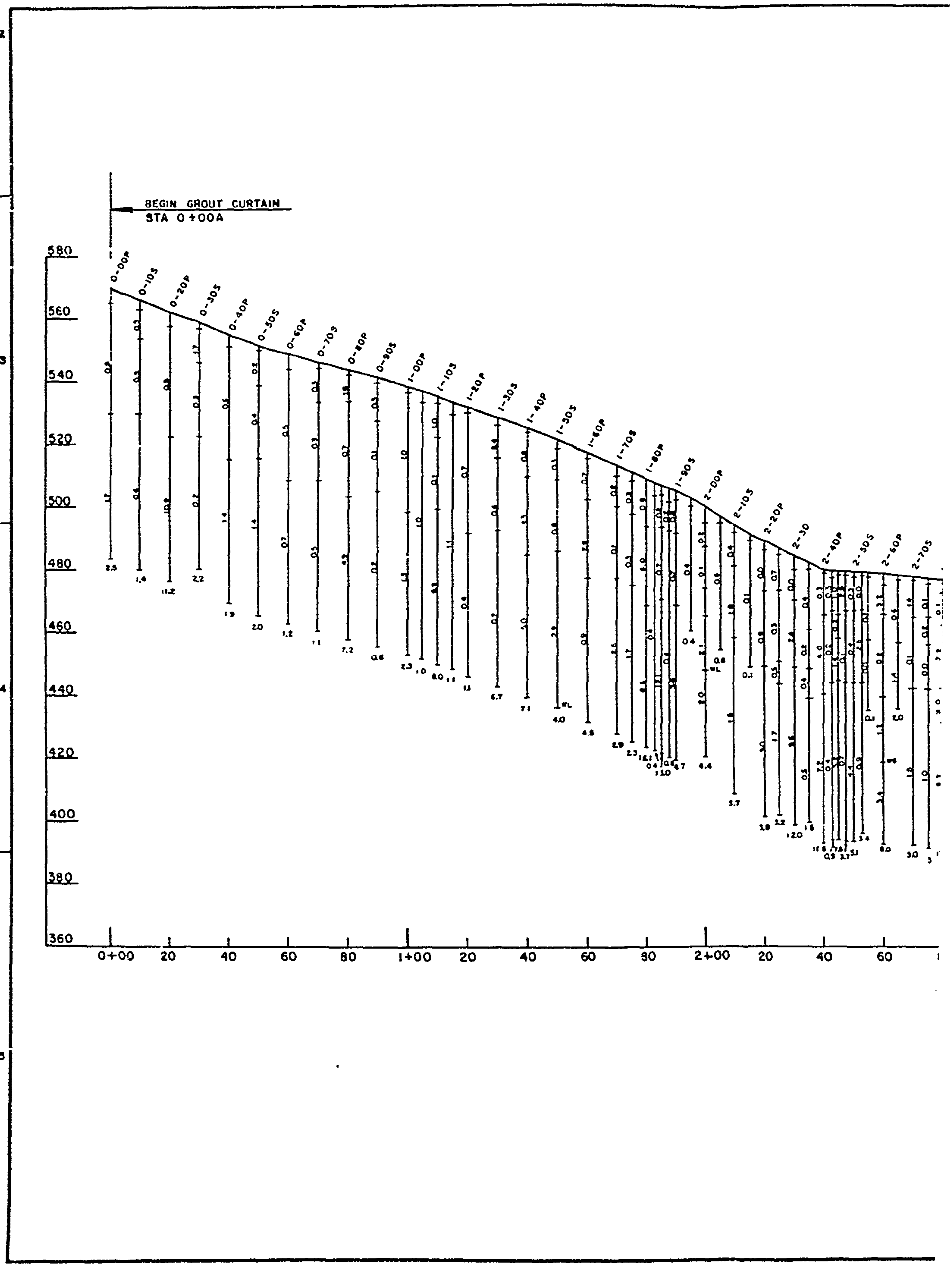
DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
STABILITY ANALYSIS
END OF CONSTRUCTION

DESIGNED BY K. Eiland
DRAWN BY K. Eiland
CHECKED BY L. Barker
SUBMITTED [illegible] CHIEF, SOILS MECH SEC
DATE DEC. 1972
SCALE AS SHOWN
TO ACCOMPANY SUPPLEMENT NO. 2
DRAWING NO. 1960-DM8-97/17



Guard rail
6" grd rolled surfacing with
El. 593.0
El. 588.0
El. 575.0
El. 573.0
Maximum water surface El. 587.9
Flood control pool El. 557.5
2nd stage cofferdam El. 526.5
Conservation pool El. 526.0
El. 573.0
Select rock
Random fill
Transition material
Impervious fill
Random fill
5' impervious (to be removed to gr line)
5' transition material
El. 512.0
Random rock fill
Existing ground line
Waste fill
Common excavation, extend to rock
Slope to be parallel to dip of rock
Grout curtain, see specifications
Foundation preparation
Excavate cutoff or to top of firm rock, whichever is the least
Presplit and concrete (D.S.)
MAIN EMBANKMENT
(TYPICAL SECTION)
SCALE: 1" = 30'
4" dashed ℄ stripe
4" edge stripe
32' Double bituminous surfacing
6" grd rolled base course
Guard rail
El. 593.0
El. 592.58
Prime to here
Overbuild Main Emb 1'-0" between Sta 13+00A to Sta 22+00A. Overbuild from 0 to 1'-0" from Sta 9+00A to Sta 13+00A, and from Sta 27+02A to Sta 22+00A
Transition material
El. 588.0
Fertilize and seed (Mix No. 1)
MAIN EMBANKMENT
Overbuild Rt. Emb varies from 1'-0" at Sta 3+08A to 0' at Sta 0+00A and at Sta 6+15A
Till, fertilize, seed (Mix No. 8) and mulch
RIGHT EMBANKMENT
TOP OF DAM DETAIL
SCALE: 1" = 5'
El. 593.0
6" grd rolled base course and surface with double bituminous surfacing.
Maximum water surface El. 587.9
Flood control pool El. 557.5
Conservation pool El. 526.0
El. 588.0
El. 575.0
3' filter "A"
3' Transition material
Select rock
Random fill
Impervious
Existing ground line
Waste fill
Common excavation, extend to rock
Slope to be parallel to dip of rock
Grout curtain see specifications
Excavate cutoff trench 10' in depth into rock or to top of firm rock, whichever is the least. See note 1
Vertical foundation protection concrete (D.S. slope only)
RIGHT EMBANKMENT
SCALE: 1" = 30'


MAIN EMBANKMENT
(TYPICAL SECTION)
SCALE 1"=30'
Guard rail
6" grd rolled base course and surfacing with double bituminous surfacing
El. 593.0
El. 588.0
El. 575.0
El. 573.0
Random fill
Transition material
Impervious fill
Random rock fill
Filter "A"
Filter "C"
6" select rock drain
Common excavation, extend to rock
Select rock drain, see special section this sheet
Escavate cutoff trench 10' in depth or to top of firm rock, whichever is the least. See note 1
Grout curtain, see specifications
Foundation preparation
Presplit and add vertical foundation protection concrete (DS slope only), conventional excavation methods where cut is less than 5'-0" DS slope protection will generally be confined to the abutments. It is to be applied as directed by the contracting officer, after all blasting and faces are exposed
Fertilize and seed (Mix No 1)
TYPICAL SECTION
TOP OF DAM ROADWAY
STA 6+15A TO STA 6+78.5A
AND
STA 8+28.5A TO STA 9+00A
Existing ground
Double bituminous surface
3" bermuda mulch sod
Prime to here
1 on 4
4" crushed stone base course
5" suitable soil
5" select material subbase
6" grd rolled base course
SPECIAL SECTION
CONSTRUCT EMBANKMENT TO THIS SECTION ONLY IN AREA WHERE SELECT ROCK DRAIN IS IN PLACE
NO SCALE
2' transition material
Filter "C" (in place)
Transition material (in place)
Filter "A" (in place)
6" select rock, drain (in place)
Random rockfill (in place)
Approximate limits of placement
TYPICAL SECTION
TOP OF DAM ROADWAY & PARKING AREA
STA 6+78.5A TO STA 8+28.5A
NO SCALE
45'-0" parking area
Wheel stop
4" edge stripe
4" dashed ℄ stripe
℄ of roadway across dam
1 on 4 slope
NOTE
1. Excavate cut-off trench approx. 10' in depth into rock or to top of firm rock which ever is the least. Final depth of cut-off trench will be determined by the Contracting Officer, after the foundation is exposed
Till, fertilize, seed (Mix No 1) and mulch
Top of rock
Existing ground line
10' collector drain
Filter "A" thickness varies see DO-8
Vertical foundation protection concrete (DS slope only)
U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA
RED RIVER WATERSHED
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY
EMBANKMENT
TYPICAL SECTIONS
DATE: DEC. 1968
PLATE NO. 3
Typical section of main embankment revised and add control for foundation preparation
Typical section of main embankment revised
Limits of filter "A" & filter "C" revised
Delete 50% density on base course
Added material upstream of top of dam roadway



BEGIN GROUT CURTAIN
STA 0+00A
580
560
540
520
500
480
460
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420
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380
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0+00
20
40
60
80
1+00
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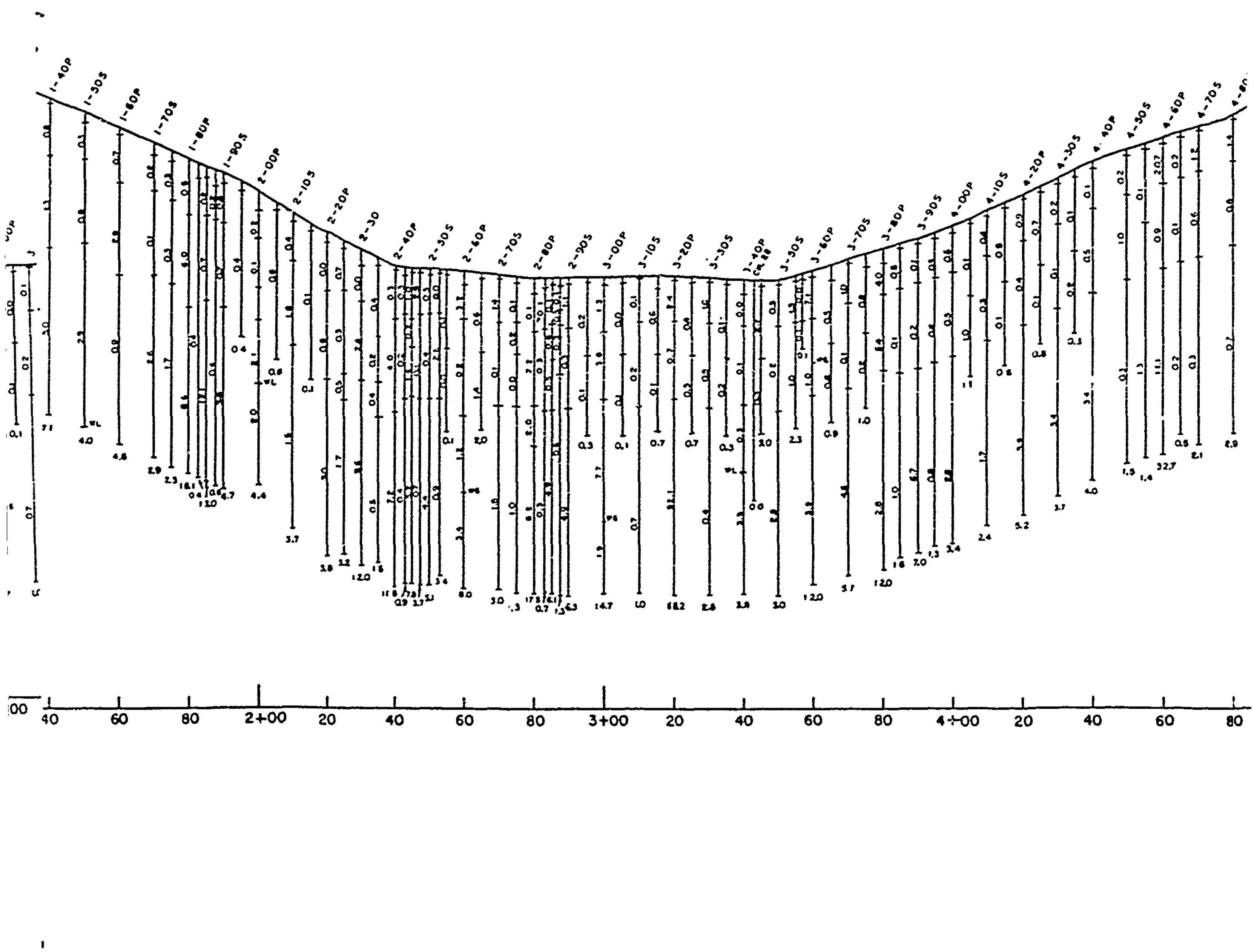
60
80
2+00
20
40
60


00
40
60
80
2+00
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40
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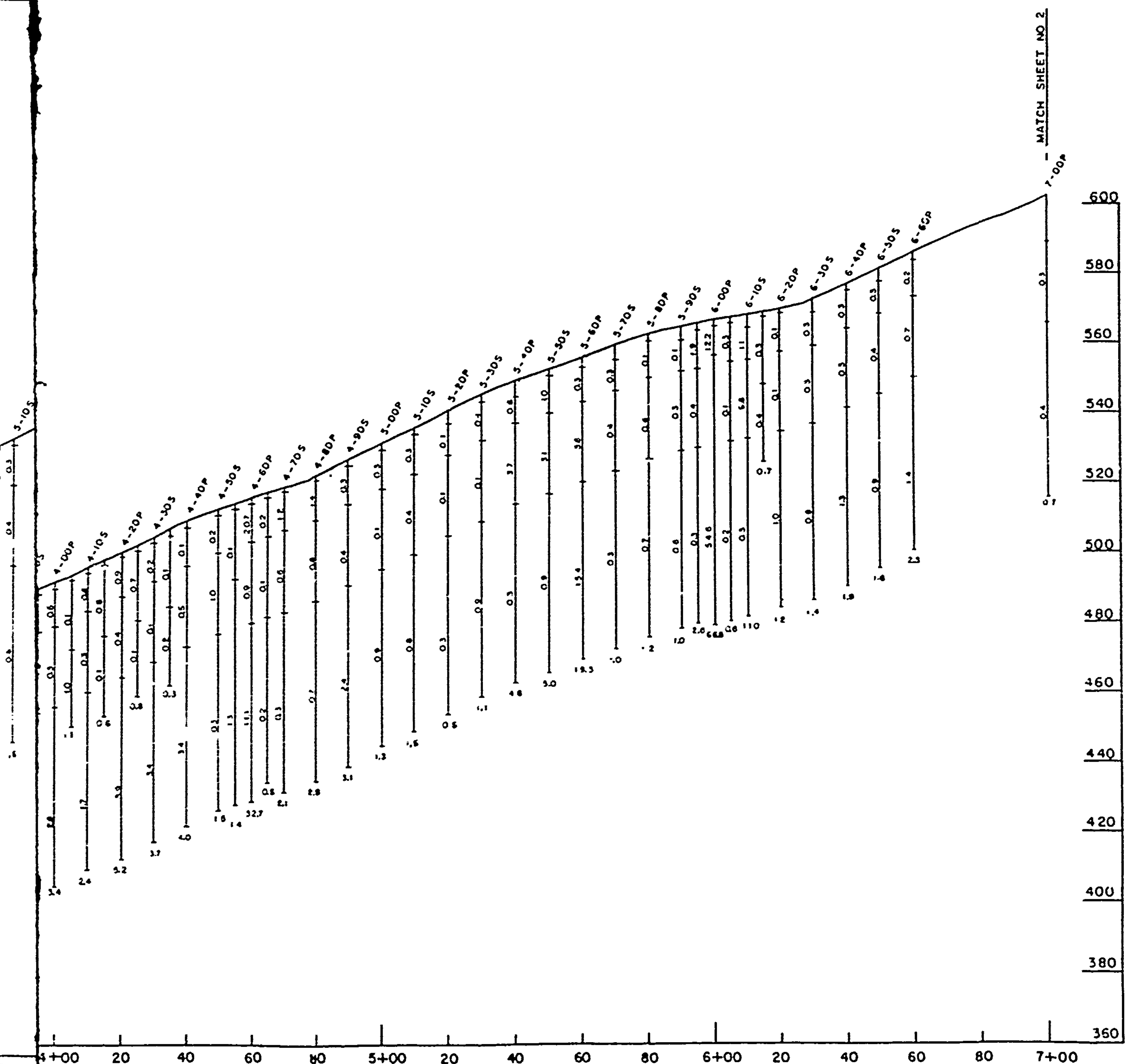
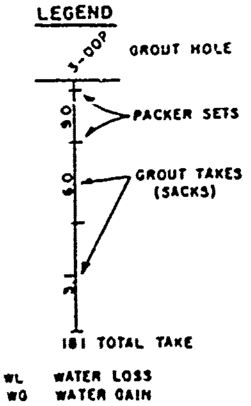
80
3+00
20
40
60
80
4+00
20
40
60
80





DEPARTMENT OF THE ARMY
TULSA DISTRICT CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARK

DESIGNED BY: Pete Williamson

DRAWN BY: Ed Chapman

CHECKED BY: Jack Harding

DIERKS DAM FOUNDATION REPORT

PART I FOUNDATION EMB. GROUTING

GROUTING PROFILE STA. 0+00 TO 7+00

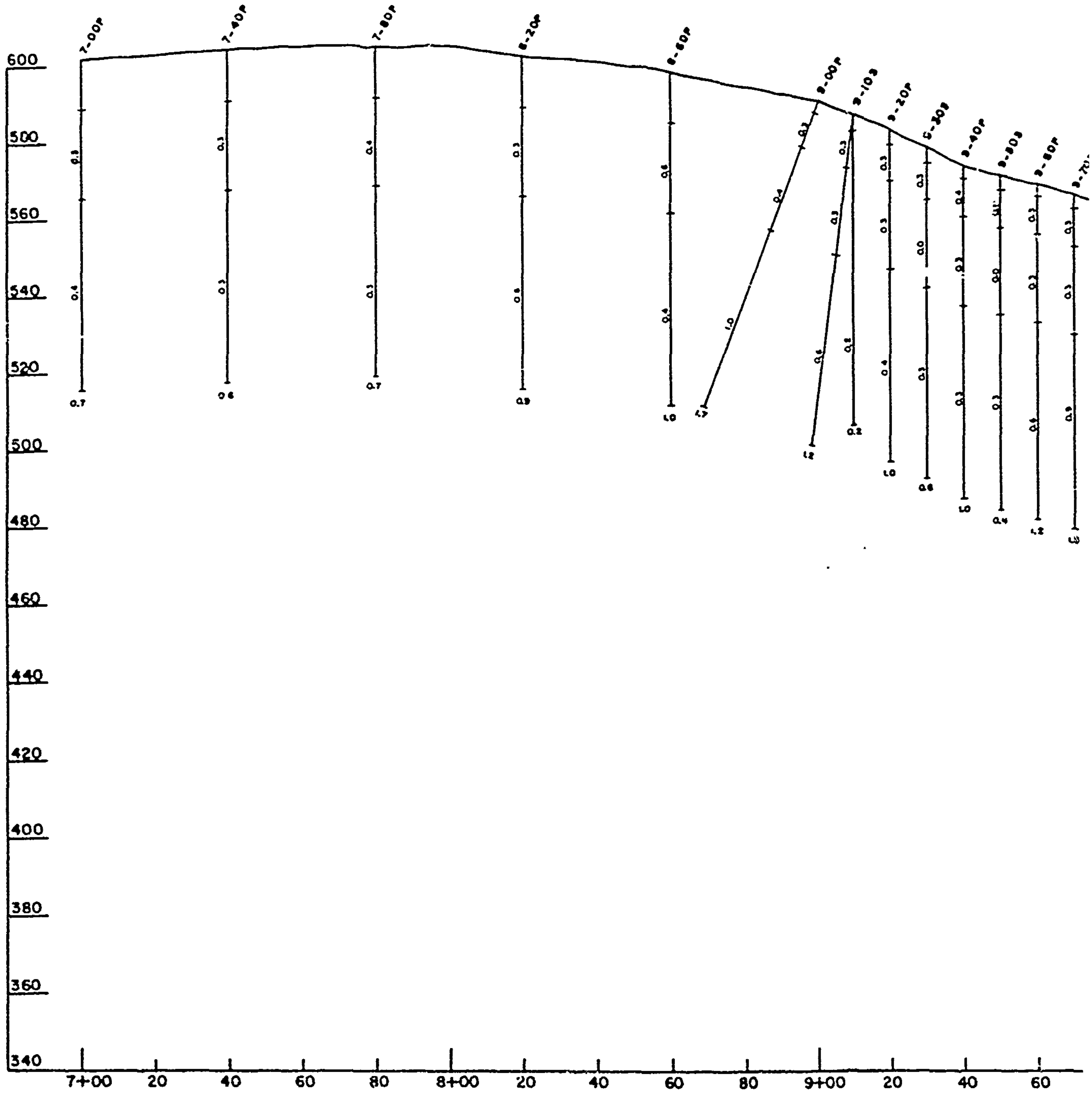
SUBMITTED: GEOLOGIST — DATE: 5 Dec 1973

APPROVED: RESIDENT ENG — DATE

2

3

4


7-00P
7-40P
7-80P
8-20P
8-60P
9-00P
9-20P
9-40P
9-80P
600
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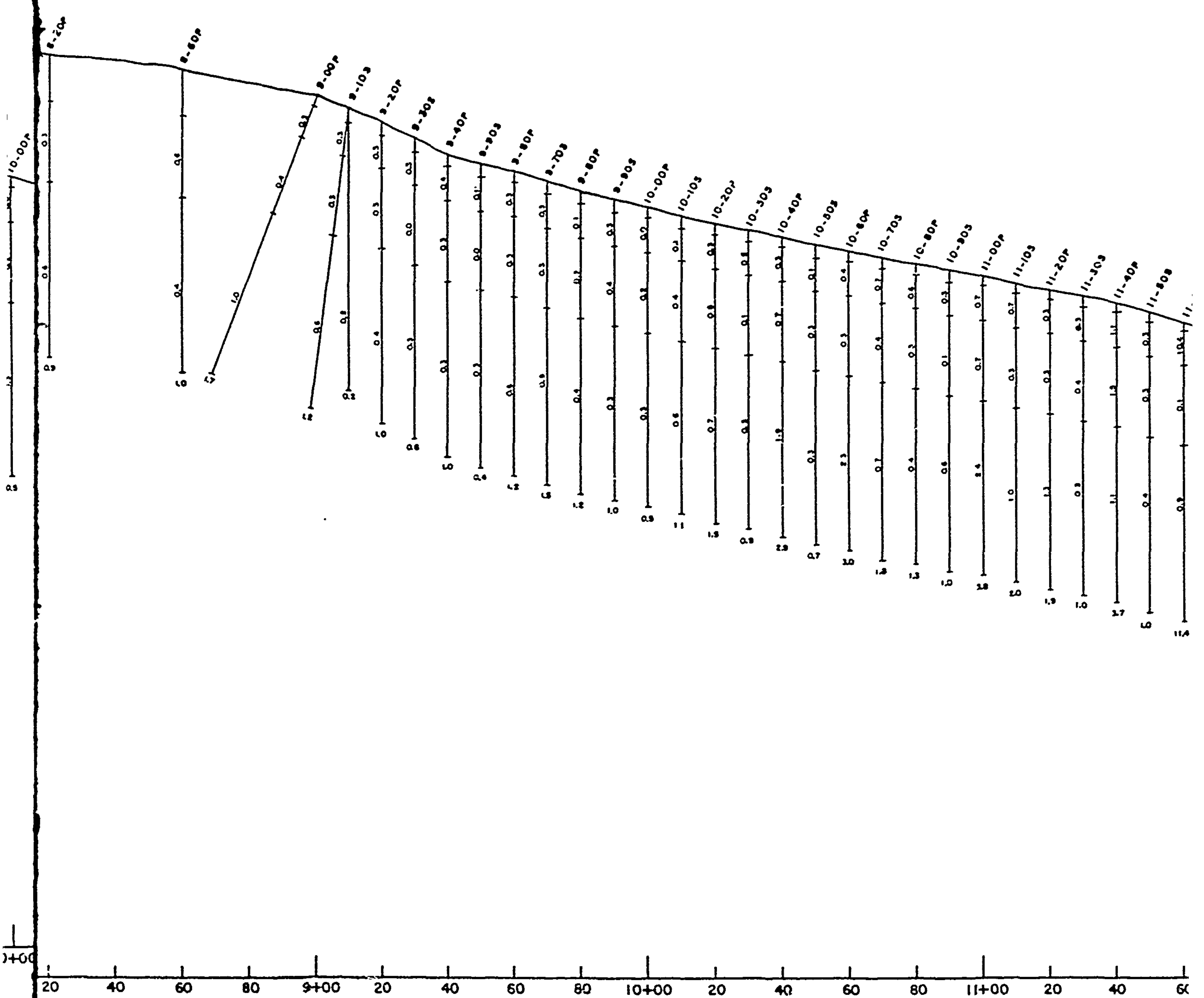
60

5

1



20
40
60
80
9+00
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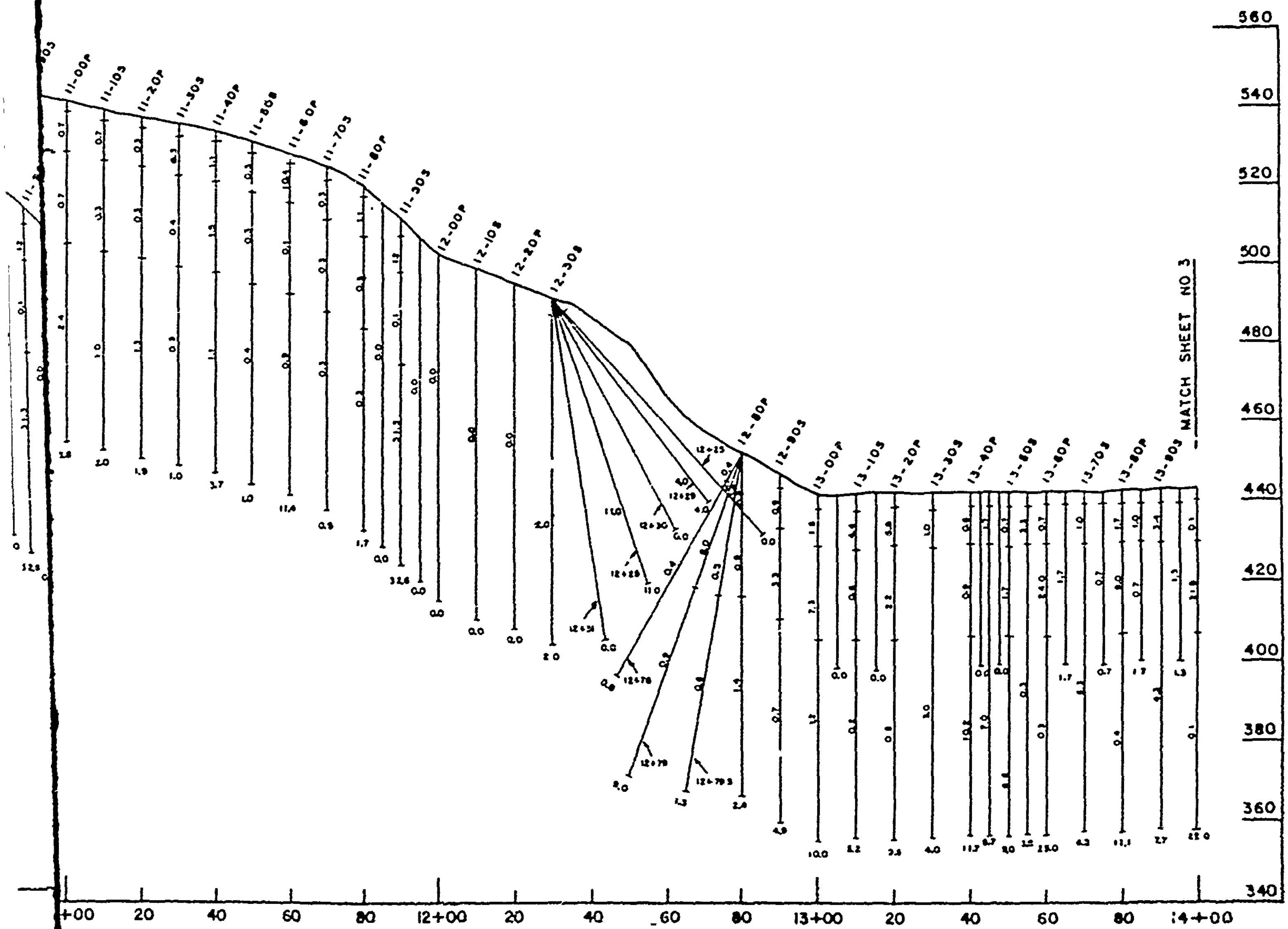
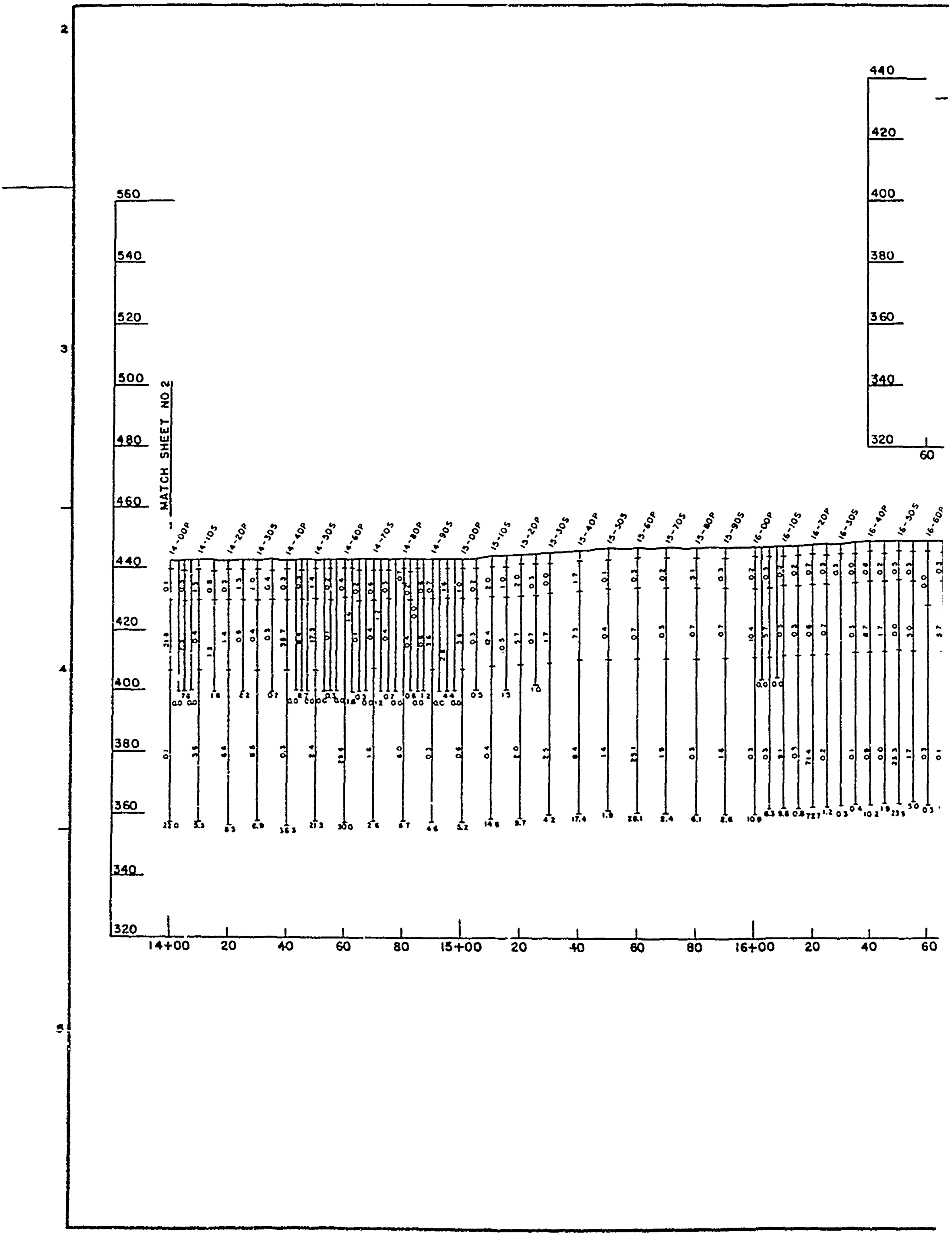
80
10+00
20
40
60
80
11+00
20
40



DEPARTMENT OF THE ARMY
TULSA DISTRICT CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY: Pete Williamson	RED RIVER WATERSHED — SALINE RIVER, ARK.
DRAWN BY: EA Chapman	DIERKS DAM FOUNDATION REPORT
CHECKED BY: Jack Harding	PART I FOUNDATION EMB. GROUTING — GROUTING PROFILE STA. 7+00 TO 14+00

SUBMITTED: [signature] GEOLOGIST	APPROVED: Harold H. Ch[illegible] RESIDENT ENG
DATE: 5 Dec 1973	DATE



MATCH SHEET NO 2
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15+00
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14-50S
14-60P
14-70S
14-80P
14-90S
15-00P
15-10S
15-20P
15-30S
15-40P
15-50S
15-60P
15-70S
15-80P
15-90S
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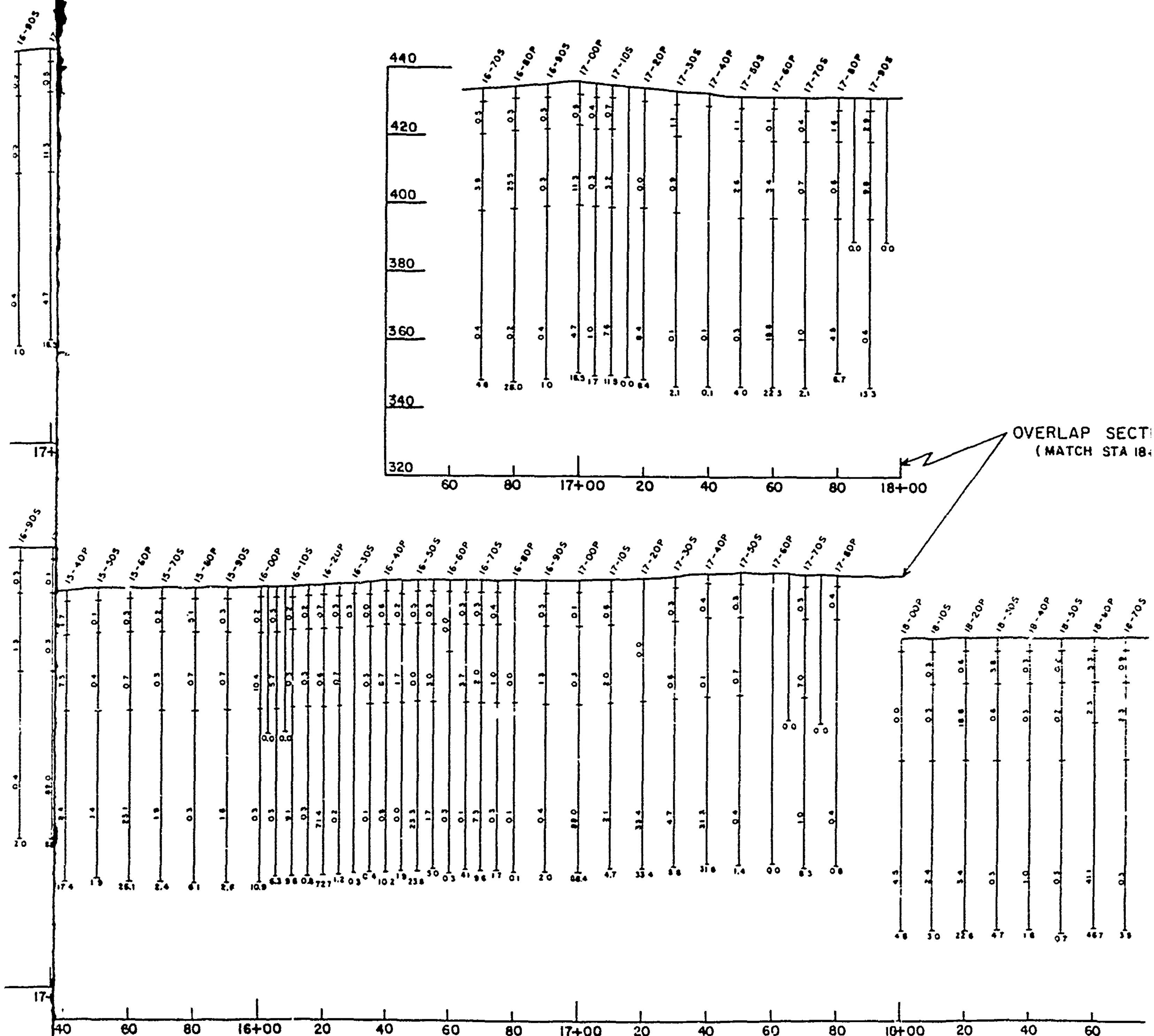
440
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(MATCH STA 18
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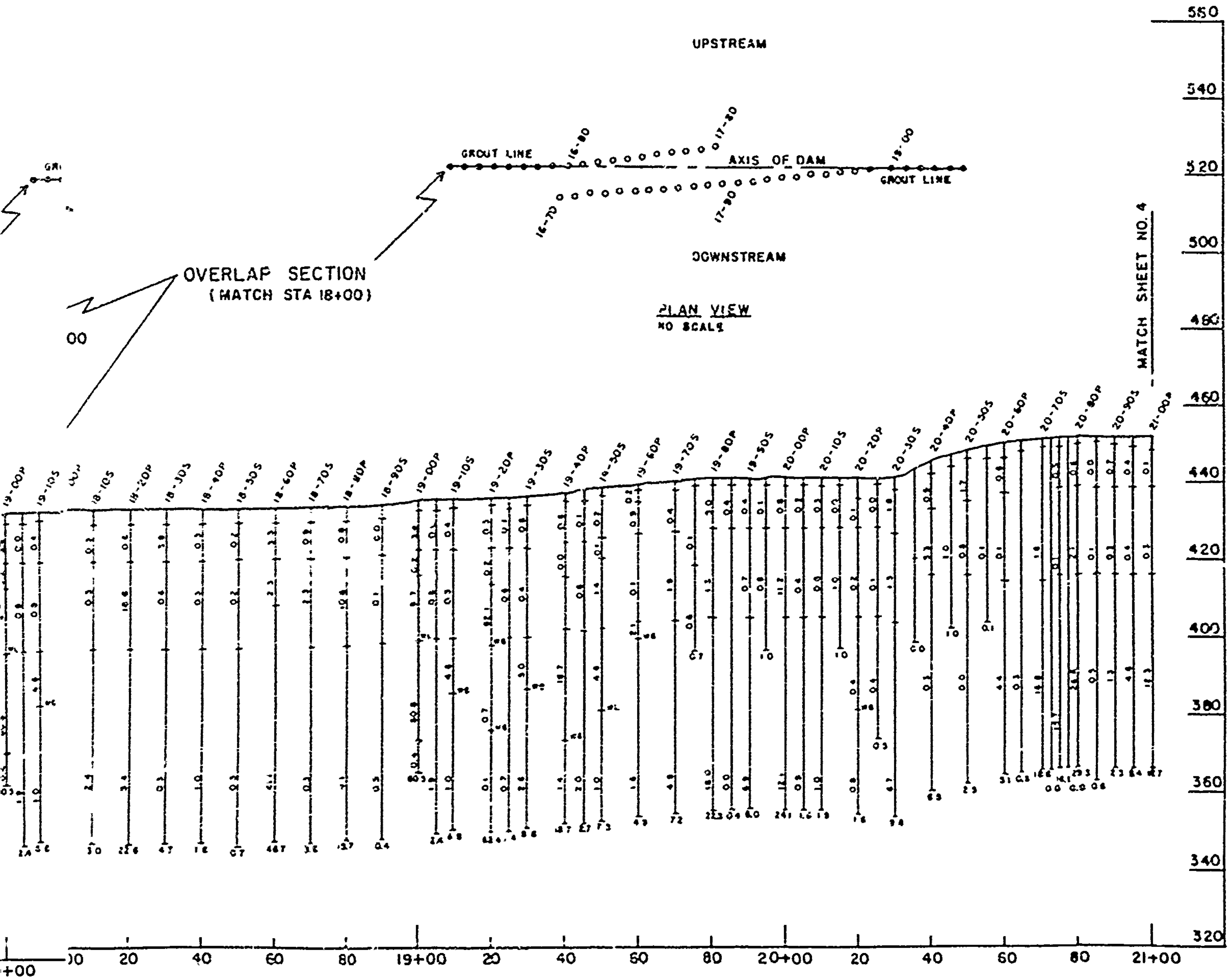
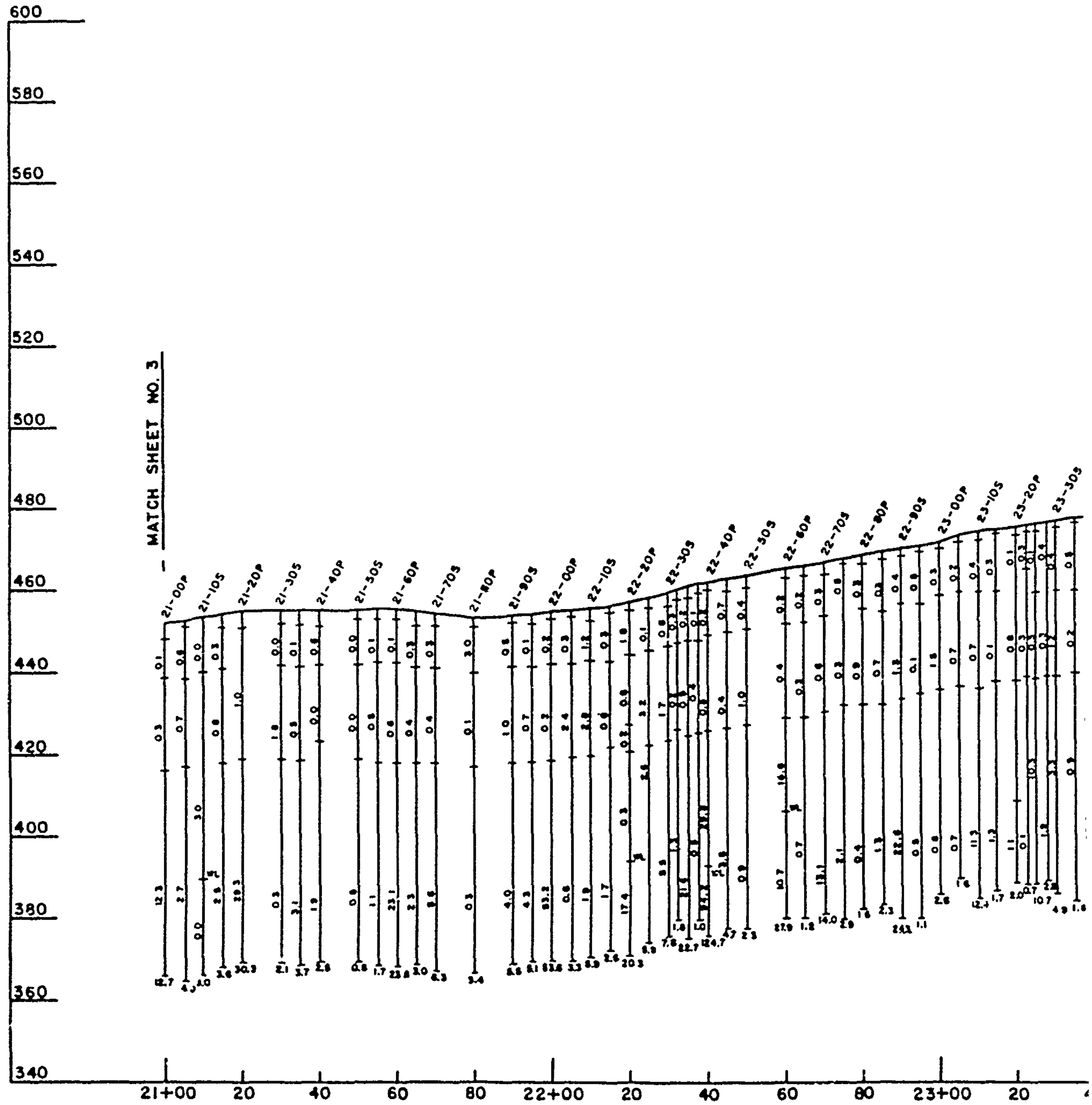
(2)



DEPARTMENT OF THE ARMY
TULSA DISTRICT CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY: Pete Williams	RED RIVER WATERSHED — SALINE RIVER, ARK
DRAWN BY: James Williams	DIERKS DAM FOUNDATION REPORT
CHECKED BY: Jack Harding	PART I FOUNDATION EMB. GROUTING — GROUTING PROFILE STA. 14+00 TO 21+00
SUBMITTED: GEOLOGIST — DATE: 5 Dec 1973	APPROVED: RESIDENT ENG — DATE



MATCH SHEET NO. 3
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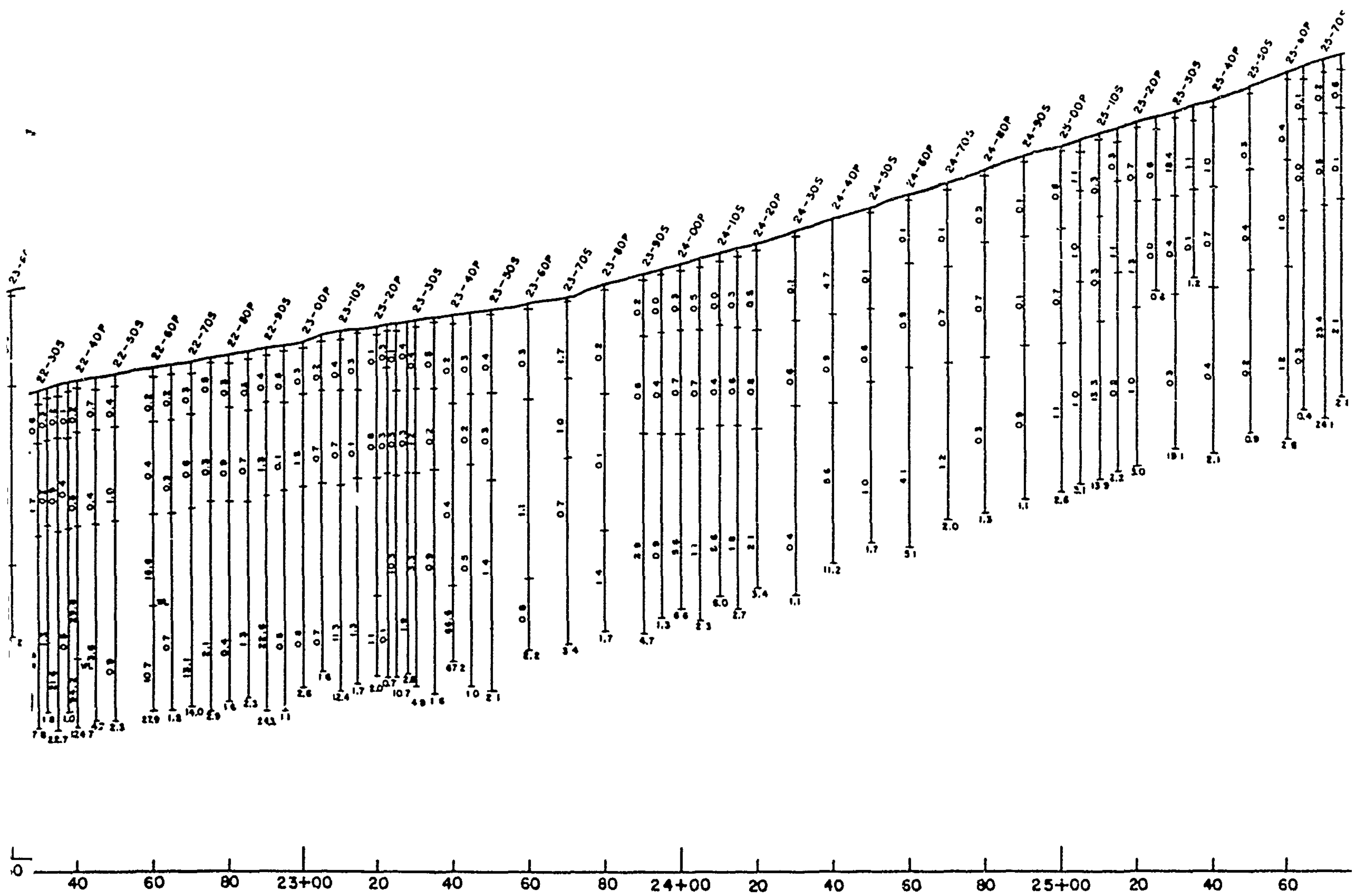
60
80
23+00
20



22-30S
22-40P
22-50S
22-60P
22-70S
22-80P
22-90S
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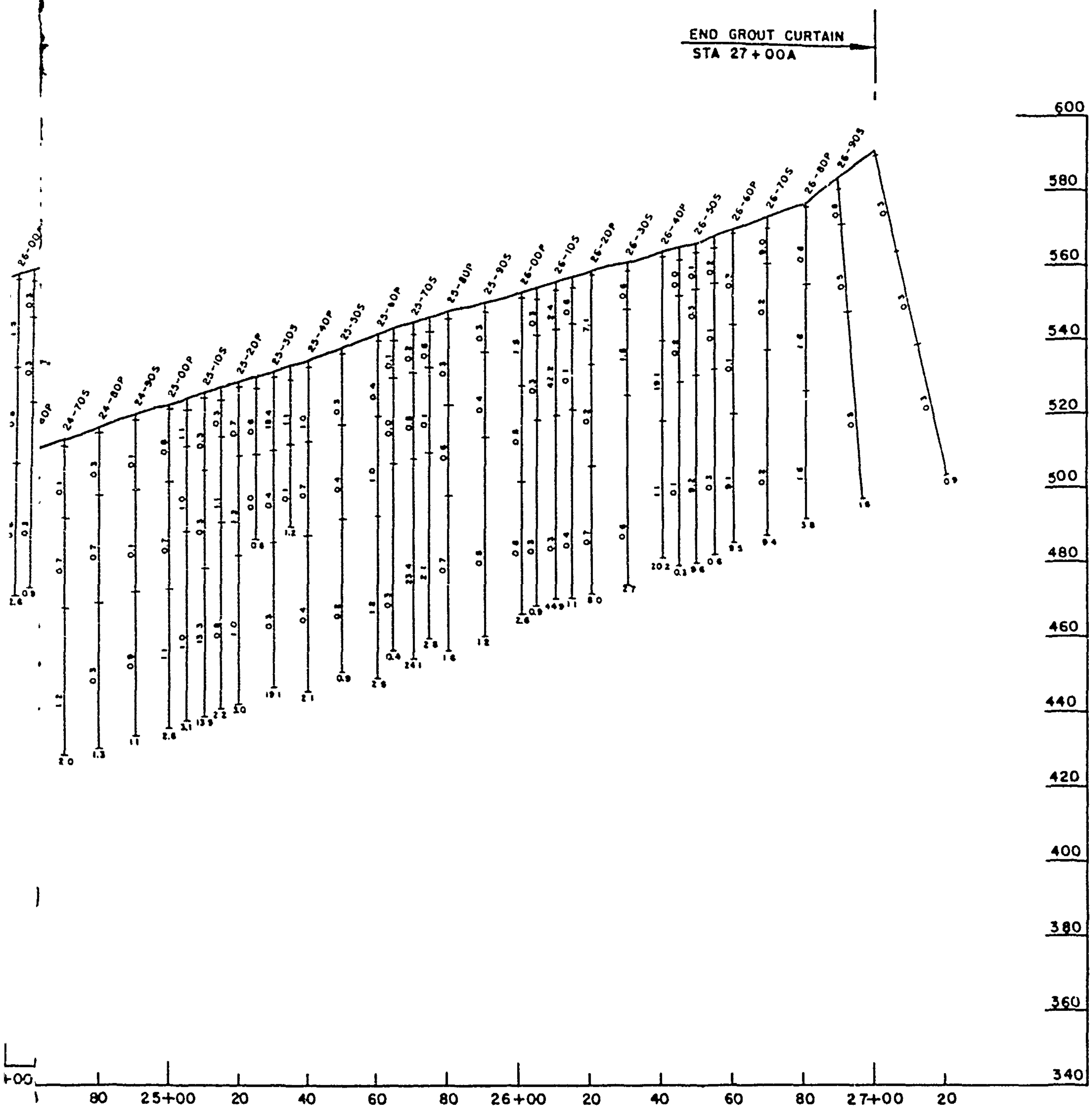
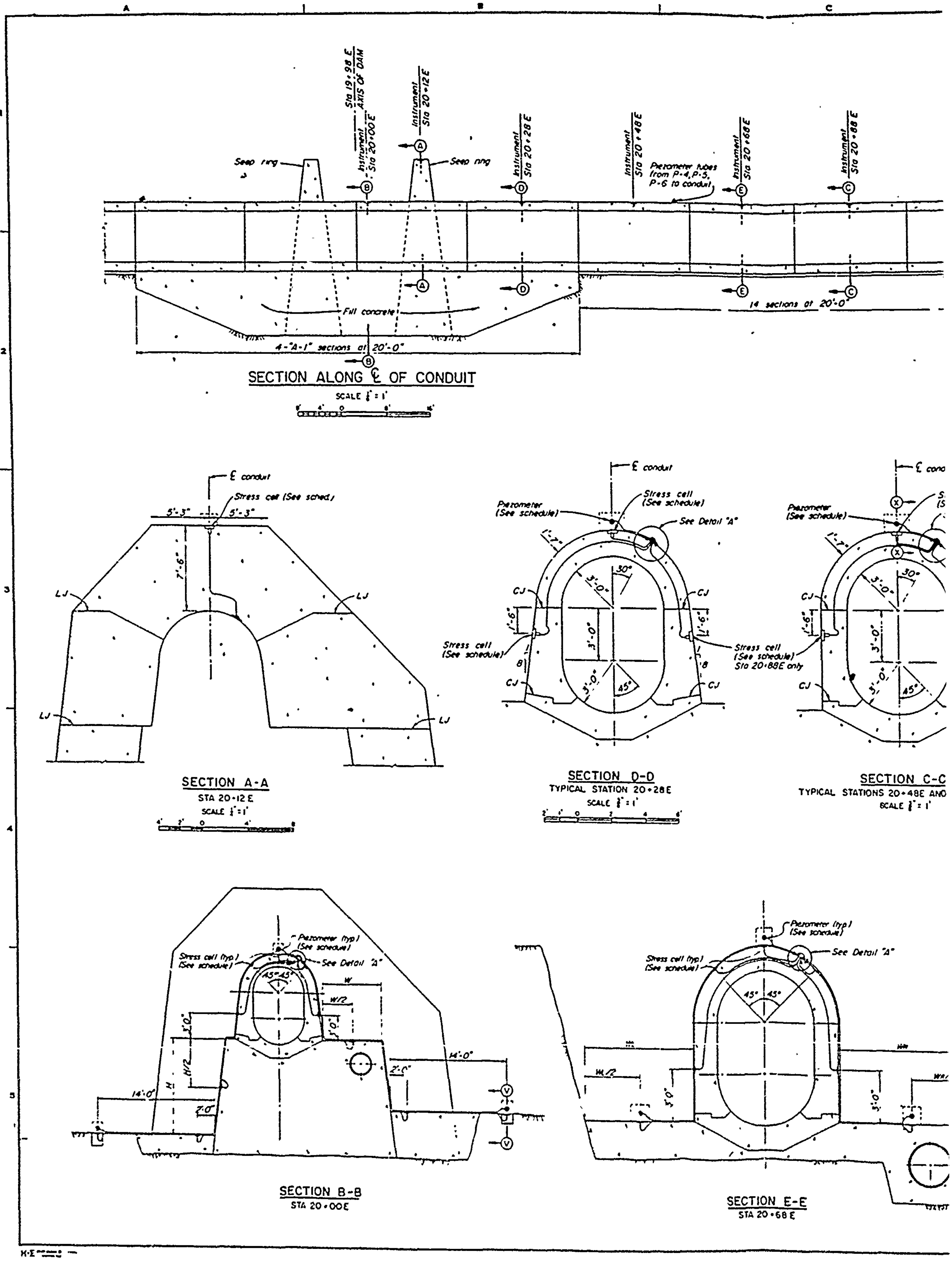


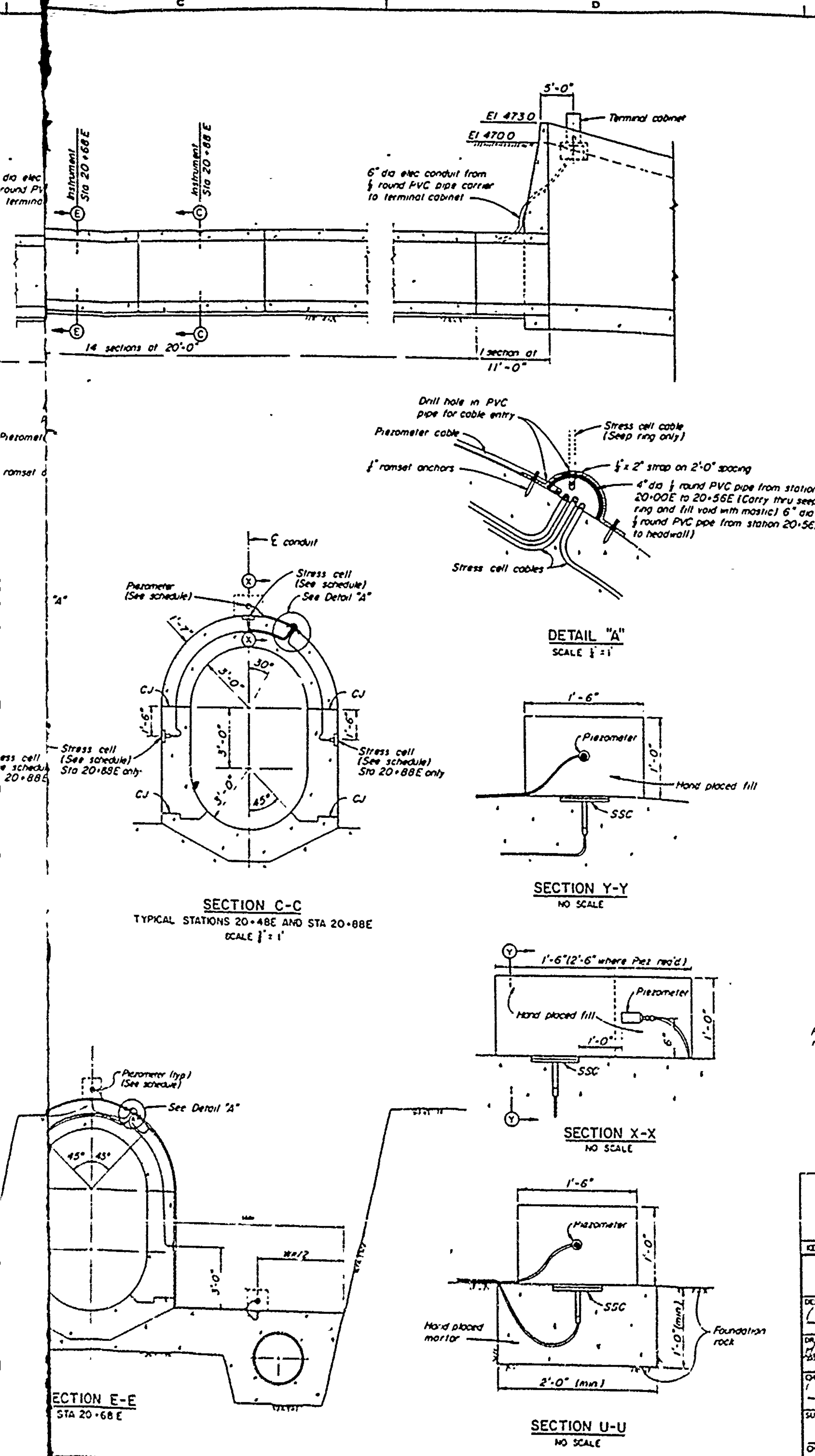
DEPARTMENT OF THE ARMY
TULSA DISTRICT CORPS OF ENGINEERS
TULSA, OKLAHOMA

DESIGNED BY: James Williamson	RED RIVER WATERSHED — SALINE RIVER, ARK
DRAWN BY: Pete Williamson	DIERKS DAM FOUNDATION REPORT
CHECKED BY: Jack Harding	PART I FOUNDATION EMB. GROUTING GROUTING PROFILE STA. 21+00 TO 27+00

SUBMITTED: [signature] GEOLOGIST DATE: 5 Dec. 1973	APPROVED. [signature] RESIDENT ENG DATE


SECTION ALONG ℄ OF CONDUIT
SCALE 1/8" = 1'
Sta 19+98 E AXIS OF DAM
Instrument Sta 20+00 E
Instrument Sta 20+12 E
Instrument Sta 20+28 E
Instrument Sta 20+48 E
Instrument Sta 20+68 E
Instrument Sta 20+88 E
Seep ring
Piezometer tubes from P-4, P-5, P-6 to conduit
Fill concrete
4-"A-1" sections at 20'-0"
14 sections at 20'-0"
℄ conduit
Stress cell (See sched.)
5'-3"
5'-3"
7'-6"
LJ
SECTION A-A
STA 20+12 E
SCALE 1/4" = 1'
Piezometer (See schedule)
Stress cell (See schedule)
See Detail "A"
1'-7"
30°
3'-0"
CJ
1'-6"
45°
Stress cell (See schedule) Sta 20+88E only
SECTION D-D
TYPICAL STATION 20+28E
SCALE 1/4" = 1'
SECTION C-C
TYPICAL STATIONS 20+48E AND
SCALE 1/4" = 1'
Piezometer (typ) (See schedule)
Stress cell (typ) (See schedule)
45° 45°
W
W/2
H
H/2
14'-0"
2'-0"
SECTION B-B
STA 20+00E
SECTION E-E
STA 20+68 E

(1)



INSTRUMENT SCHEDULE

SOIL PRESSURE CELLS

INSTRUMENT NO	STATION	LOCATION	RANGE, PSI COMPRESSION	LENGTH CABLE REQUIRED
S-1	20+00E	Top of conduit, ℄	200	390'
S-2	"	Top of conduit, 45°L Rt	200	400'
S-3	"	Top of conduit, 45°L Lt	200	390
S-4	"	Side of conduit, Rt	100	400'
S-5	"	Side of conduit, Lt	100	395'
S-6	"	Top of conduit base, Lt	200	400
S-7	"	Side of conduit base Rt	100	410'
S-8	"	Fill concrete, Rt	200	420'
S-9	"	Fill concrete, Lt	200	415
S-10	"	Rock, foundation Rt	200	430'
S-11	"	Rock, foundation Lt	200	430'
S-12	20+12E	Top of seep ring, ℄	200	385'
S-13	20+28E	Top of conduit, ℄	200	360'
S-14	"	Side of conduit, Rt	100	370'
S-15	"	Side of conduit, Lt	100	360'
S-16	20+48E	Top of conduit ℄	200	310'
S-17	20+68E	Top of conduit, ℄	200	315'
S-18	"	Top of conduit 45°L Rt	200	325'
S-19	"	Top of conduit, 45°L Lt	200	315'
S-20	"	Side of conduit, Rt	100	325'
S-21	"	Side of conduit Lt	100	320'
S-22	"	Fill concrete, Rt	200	355'
S-23	"	Fill concrete, Lt	200	330'
S-24	20+88E	Top of conduit, ℄	200	295'
S-25	"	Side of conduit, Rt	100	305'
S-26	"	Side of conduit, Lt	100	300'

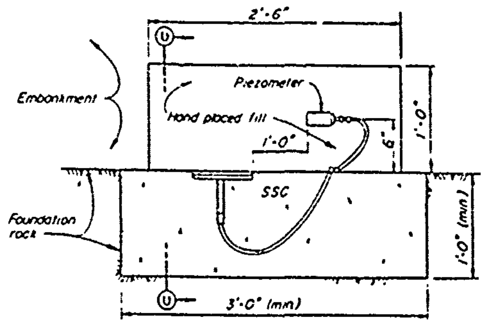
NOTES: 1 Soil pressure cells shall be Carlson type soil stress cells
2. Terminal ends of cables shall be permanently identified to show stress cell to which attached

PIEZOMETERS

INSTRUMENT NO	STATION	LOCATION	LENGTH CABLE ATTACHED
P-4	13+30A	Main embankment filter "A", El 442 0±	1100'
P-5	17+30A	Main embankment filter "A", El 433 0±	650'
P-6	21+42A	Main embankment filter "A", El 455 0±	485'
P-7	20+00E	Top of conduit, ℄	390'
P-8	"	Top of rock, foundation Rt	430'
P-9	"	Top of rock, foundation Lt	430'
P-10	20+28E	Top of conduit, ℄	360'
P-11	20+68E	Top of conduit, ℄	315'
P-12	"	Fill concrete, Rt	355'
P-13	"	Fill concrete, Lt	330'
P-14	20+88E	Top of conduit, ℄	295'

NOTES 1 Piezometers shall be nitrogen gas operated pore pressure transducers (Slope indicator Co., No 51402) and shall be furnished by the government with full length cable attached
2 See contract Dwgs #13/1 and 13/2 for piezometer installations in right embankment
3 Terminal ends of cables shall be permanently identified to show transducer to which attached

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT



KEY	DATE	CHANGE	REVISION (INDICATED BY △)	APPR

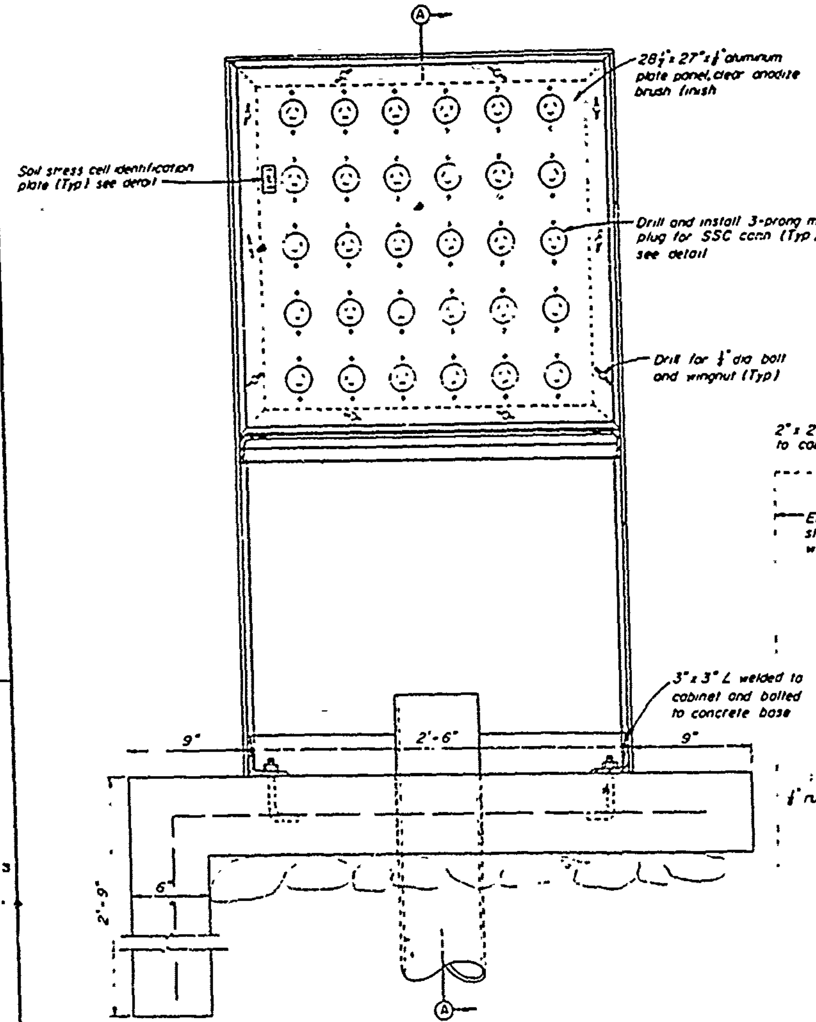
U. S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS.
ENGINEERING MEASUREMENT DEVICES
CONDUIT
SECTIONS AND DETAIL

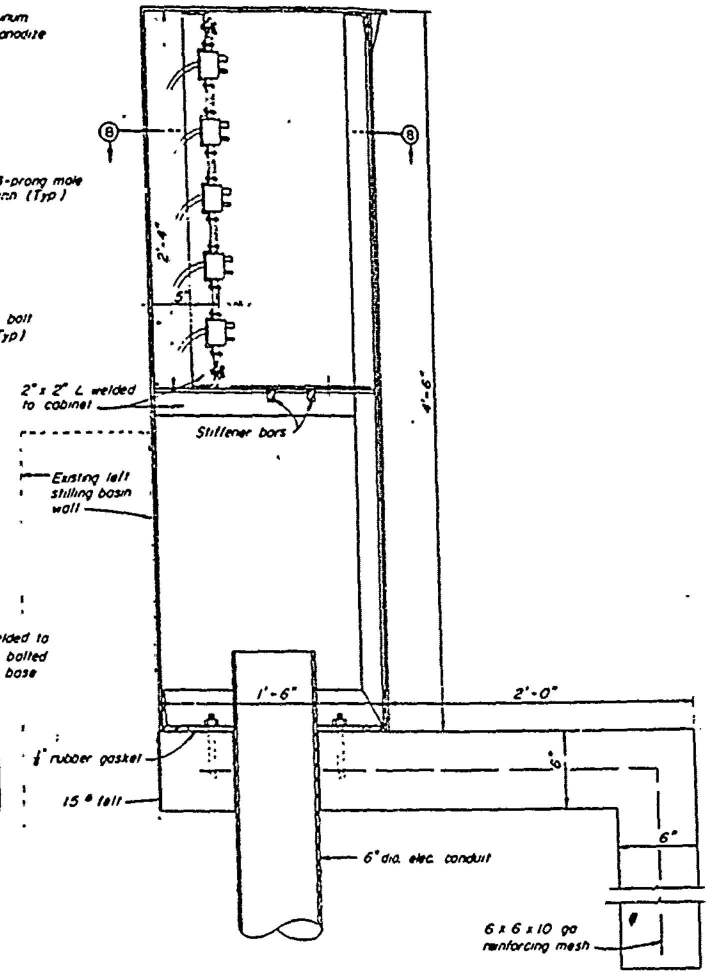
DESIGNED BY: (signature)
DRAWN BY: (signature)
CHECKED BY: (signature)
SUBMITTED: (signature)
CHIEF, FDNS & MATLS BR
DATE FEB. 1971

INVITATION NO. DACW38- -B-00
SCALE AS SHOWN
DRAWING NUMBER 1960-C3-13/4



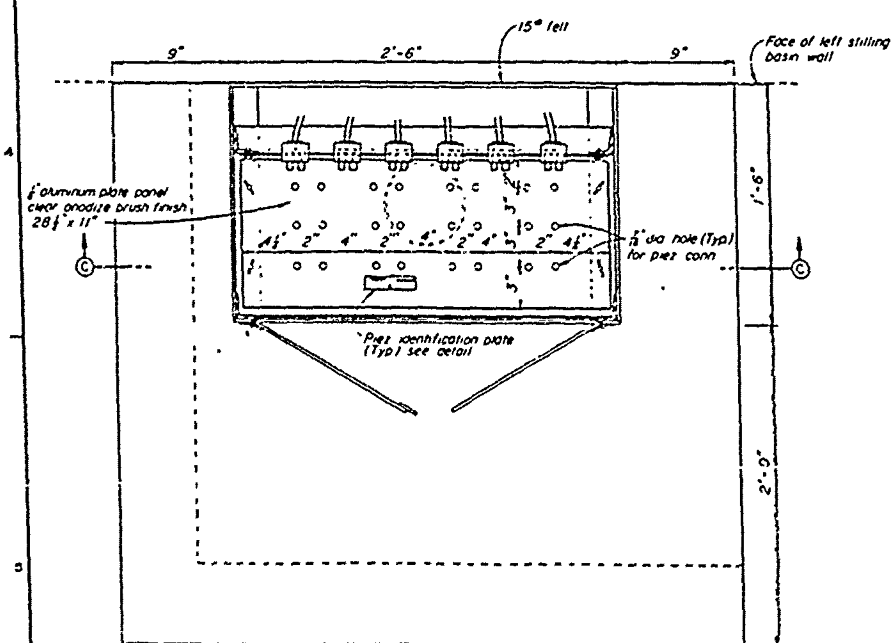
SECTION C-C

SCALE ¾" = 1"



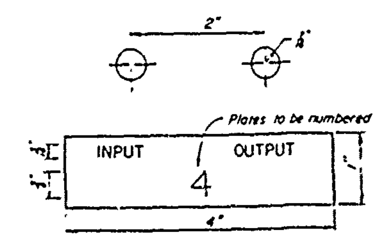
SECTION A-A

SCALE ¾" = 1"



SECTION B-B

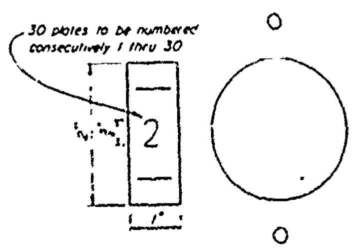
SCALE ¾" = 1"



PIEZOMETER IDENTIFICATION PLATE

(MATERIAL TO BE BLACK BAKELITE W/ WHITE LETTERS)

SCALE 1" = 1"



STRESS CELL IDENTIFICATION PLATE

(BLACK BAKELITE W/ WHITE LETTERS)

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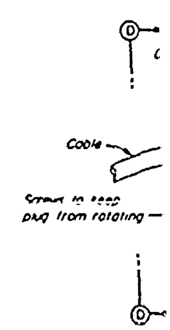
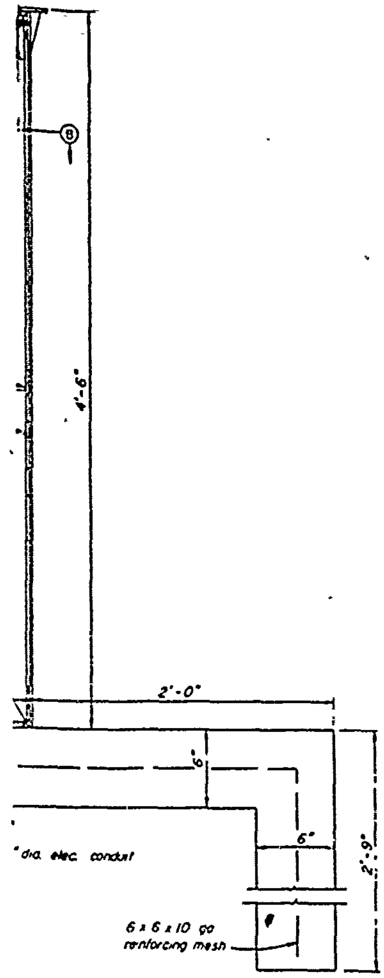
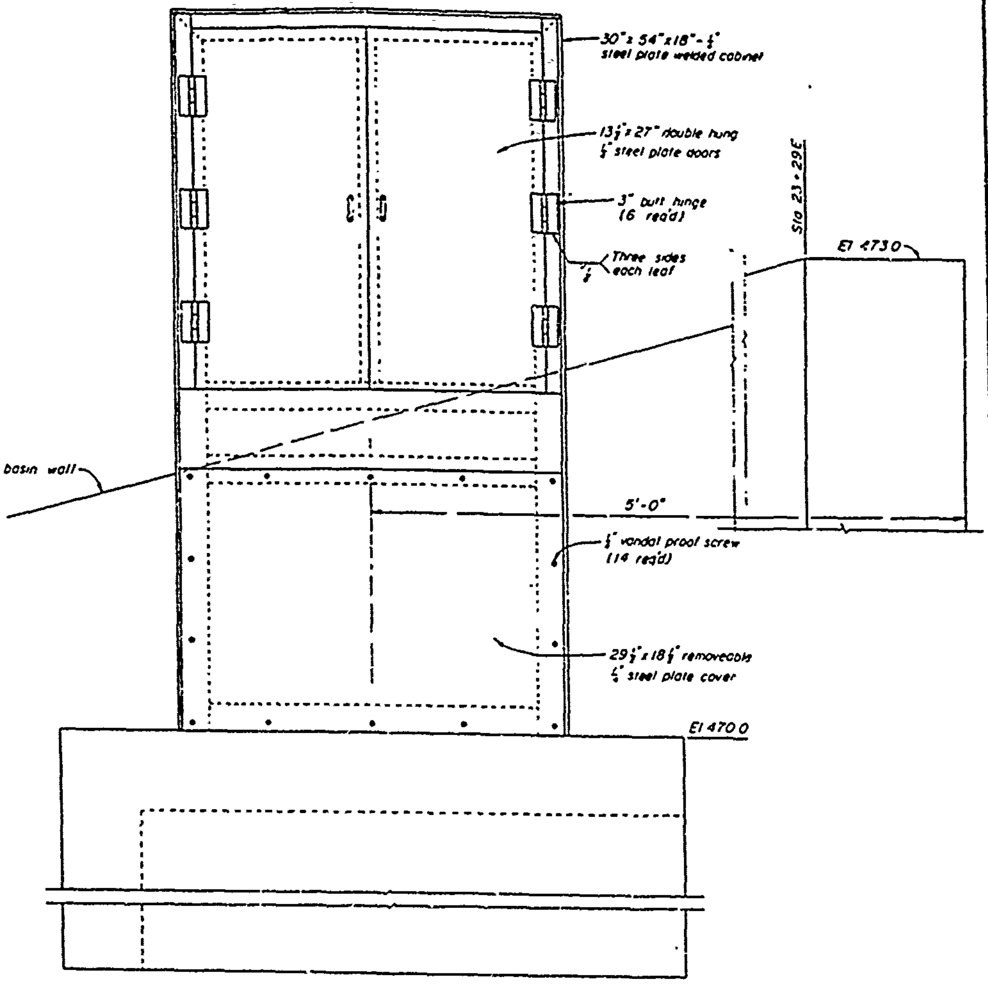


K-E

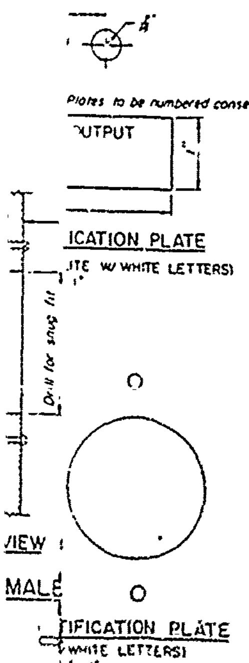
①

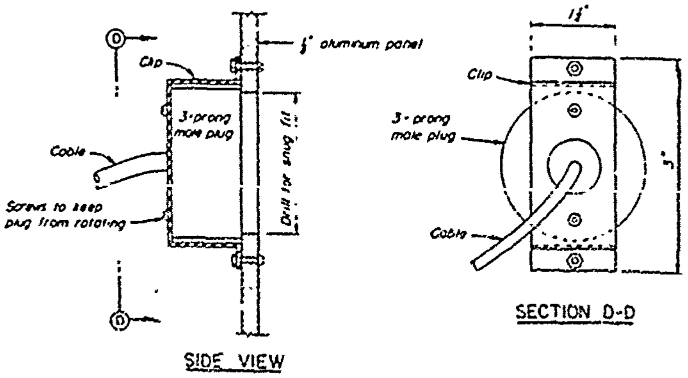


TION A-A
ALE ¾" = 1"



ELEVATION
SCALE ¾" = 1"





MALE PLUG CLIP DETAIL
SCALE 1" = 1"

NOTES
1. Provide a locking device for the cabinet doors as specified
2. See specifications for painting requirements
3. Temporary facilities will be provided so measurements can be made by the government using portable read-out equipment

THIS DRAWING WAS ORIGINALLY PREPARED FOR USE AS A CONTRACT DRAWING AND WAS REPRODUCED FOR USE IN THIS REPORT

KEY	DATE	CHANGE	REVISION INDICATED BY	APPR

U. S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS
DIERKS DAM
EMB, OUTLET WORKS, SPILLWAY & ACCESS RDS
ENGINEERING MEASUREMENT DEVICES
EMBANKMENT
TERMINAL CABINET-SECTIONS, ELEVATION & DETAILS

DESIGNED BY / DRAWN BY / CHECKED BY / SUBMITTED / CHIEF, ENG & MATLS BR
INVITATION NO. DACW56- -B-00
SCALE AS SHOWN
DATE FEB 1971
DRAWING NUMBER 1960-C3-13/5

REQUIRED EXCAVATIONS

	MAIN EMBANKMENT FOUNDATION	RIGHT EMBANKMENT FOUNDATION	SPILLWAY	RIDGE NO OF SPILLWAY	LEFT ABUTMENT ACCESS ROAD	RT ABUTMENT ACCESS ROAD	STILLING BASIN ACCESS ROAD	SPILLWAY AND DAM SERVICE ROAD	TOTAL EXCAVATION	BALANCE FACTOR	TOT NEAT
STRIPPING	36,000	34,000	28,000	12,000	1,800	3,200	3,400	2,000	120,400	WASTE	
UNCLASSIFIED FDN.EXCAV. (OVERBURDEN)	420,000	NONE	NONE	NONE	NONE	NONE	NONE	NONE	420,000	0.85	26
UNCLASSIFIED RDWY.EXCAV. (OVERBURDEN & ROCK)	NONE	NONE	NONE	NONE	42,000	22,500	15,000	4,500	84,000	0.90	75
ROCK, CLASS IV (1)	26,000	8,000	570,000	86,000	NONE	NONE	NONE	NONE	690,000	1.00	21
ROCK, CLASS I	NONE	NONE	281,000	49,000	NONE	NONE	NONE	NONE	330,000	1.10	36
ROCK, CLASS II	NONE	NONE	563,000	49,000	NONE	NONE	NONE	NONE	612,000	1.10	67
ROCK, CLASS III	NONE	NONE	356,000	49,000	NONE	NONE	NONE	NONE	405,000	1.10	8
TOTAL	482,000	42,000	1,798,000	245,000	43,800	25,800	18,400	6,500	2,671,400		

EXCESS 48,000

63,000

EXCESS 133,000

345,000

(1) Consists of overburden, badly weathered rock, shale and undifferentiated rock of classes II and III. Fifty percent of total quantity assumed to be suitable for random rock fill.

SAND AND GRAVEL FOR PROCESSING 82,200

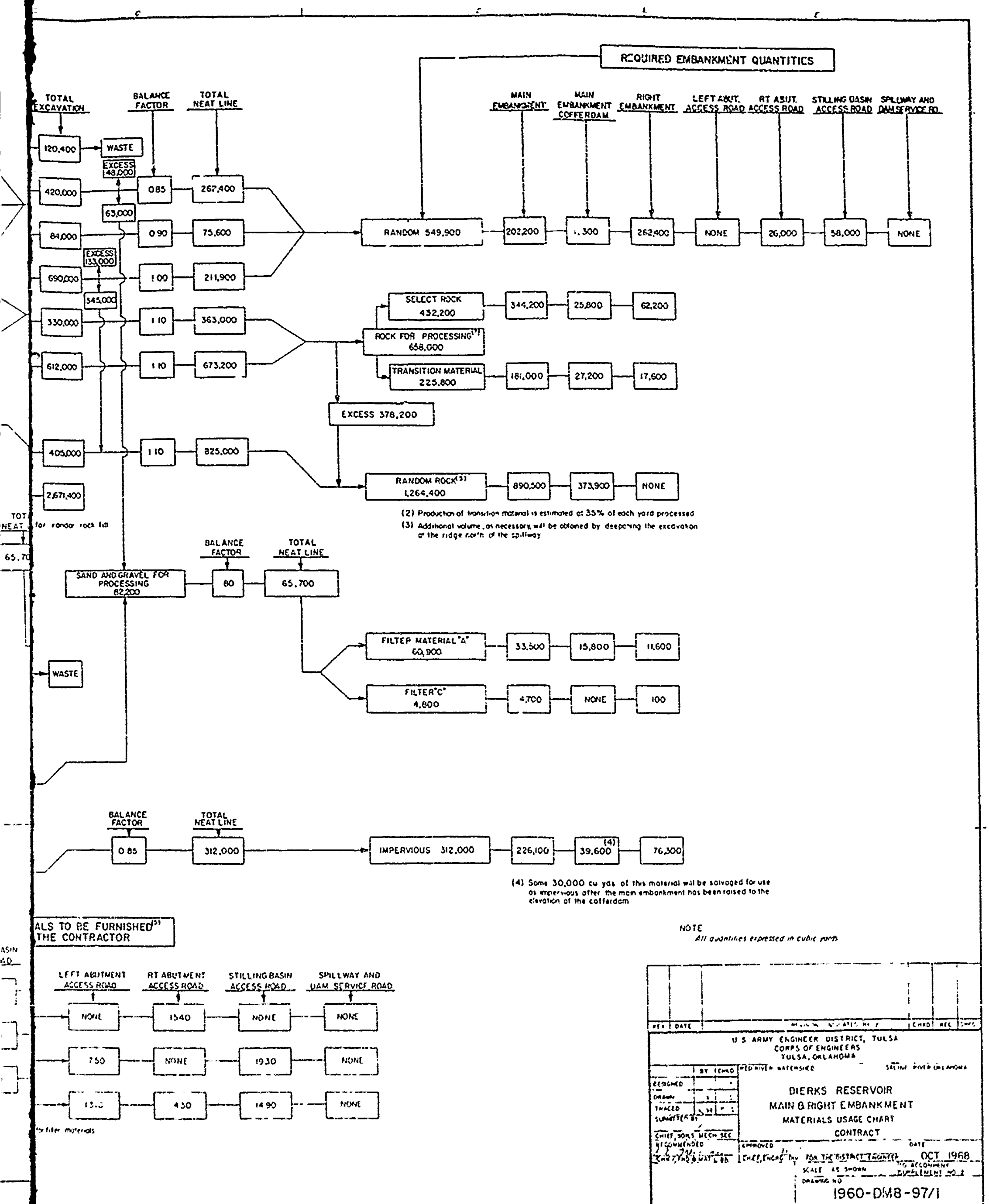
BORROW MATERIALS

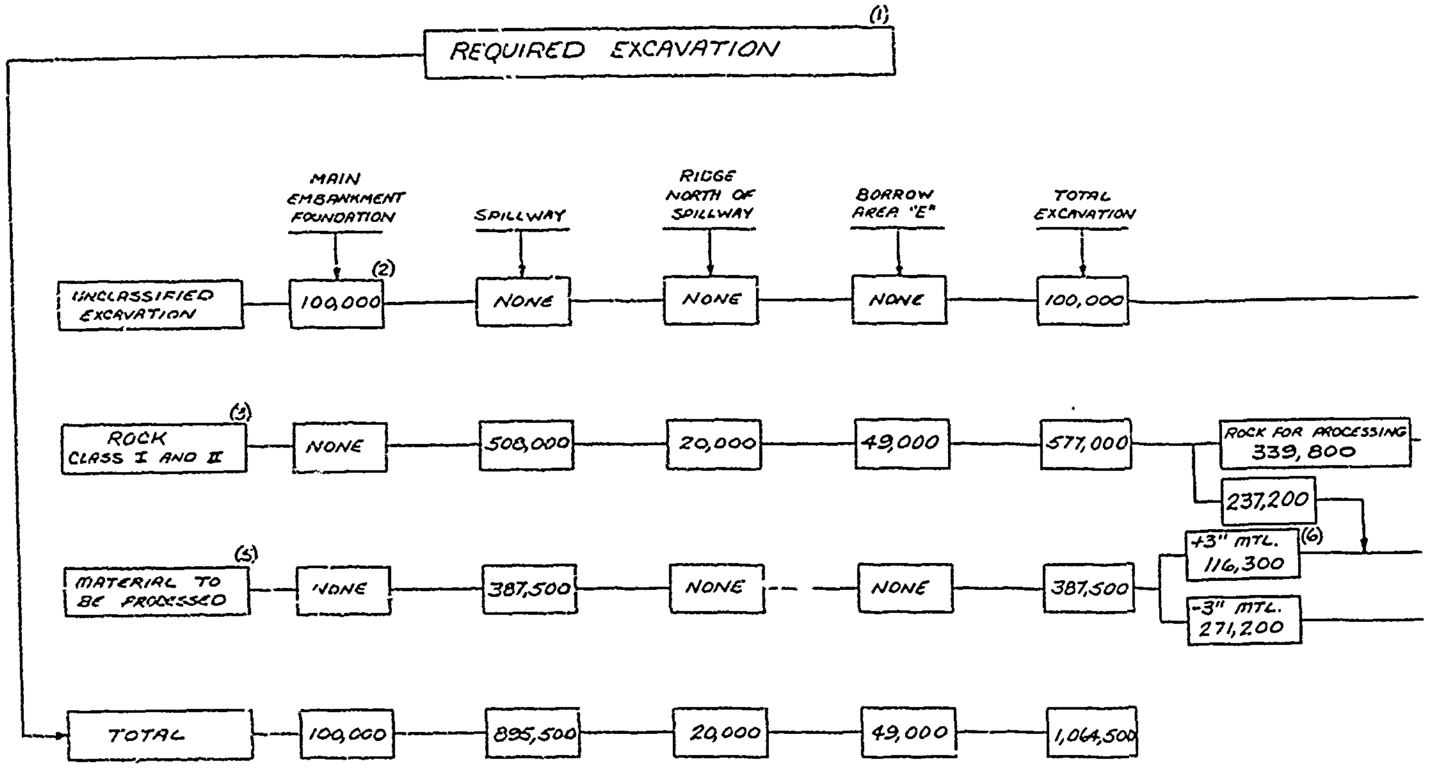
	AREA D_1	AREA D_2	AREA E	AREA C	EXCAVATION	
STRIPPING	10,000	25,000	25,000	25,000	60,000	WASTE
SAND & GRAVEL	80,000	NONE	NONE	NONE	RESERVE 60,800; 19,200	
IMPERVIOUS	NONE	125,000	100,000	500,000	RESERVE 358,000; 307,000	BALANCE FACTOR 0.85

MATERIALS TO BE FURNISHED BY THE CONTRACTOR (5)

	TOTAL	LEFT ABUTMENT ACCESS ROAD	RT ABUTMENT ACCESS ROAD
TRAFFIC BOUND SURFACE COURSE	1540	NONE	1540
STAB. BASE COURSE	2680	750	NONE
SUBBASE	3230	1310	430

(5) These materials may be obtained from the sand and gravel sources for filter materials provided ample quantities are available.


REQUIRED EMBANKMENT QUANTITIES
TOTAL EXCAVATION
BALANCE FACTOR
TOTAL NEAT LINE
MAIN EMBANKMENT
MAIN EMBANKMENT COFFERDAM
RIGHT EMBANKMENT
LEFT ABUT. ACCESS ROAD
RT ABUT. ACCESS ROAD
STILLING BASIN ACCESS ROAD
SPILLWAY AND DAM SERVICE RD.
120,400
WASTE
EXCESS 48,000
420,000
0.85
267,400
63,000
84,000
0.90
75,600
RANDOM 549,900
202,200
1,300
262,400
NONE
26,000
58,000
NONE
EXCESS 133,000
690,000
1.00
211,900
345,000
330,000
1.10
363,000
SELECT ROCK 432,200
344,200
25,800
62,200
ROCK FOR PROCESSING(2) 658,000
612,000
1.10
673,200
TRANSITION MATERIAL 225,800
181,000
27,200
17,600
EXCESS 378,200
405,000
1.10
825,000
RANDOM ROCK(3) 1,264,400
890,500
373,900
NONE
2,671,400
(2) Production of transition material is estimated at 35% of each yard processed
(3) Additional volume, as necessary, will be obtained by deepening the excavation of the ridge north of the spillway
for random rock fill
SAND AND GRAVEL FOR PROCESSING 82,200
BALANCE FACTOR
80
TOTAL NEAT LINE
65,700
FILTER MATERIAL "A" 60,900
33,500
15,800
11,600
FILTER "C" 4,800
4,700
NONE
100
WASTE
BALANCE FACTOR
0.85
TOTAL NEAT LINE
312,000
IMPERVIOUS 312,000
226,100
39,600(4)
76,300
(4) Some 30,000 cu yds of this material will be salvaged for use as impervious after the main embankment has been raised to the elevation of the cofferdam
ALS TO BE FURNISHED(5) THE CONTRACTOR
NOTE
All quantities expressed in cubic yards
LEFT ABUTMENT ACCESS ROAD
RT ABUTMENT ACCESS ROAD
STILLING BASIN ACCESS ROAD
SPILLWAY AND DAM SERVICE ROAD
NONE
1540
NONE
NONE
750
NONE
1930
NONE
430
1490
NONE
for filter materials
U S ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA
RED RIVER WATERSHED
DIERKS RESERVOIR
MAIN & RIGHT EMBANKMENT
MATERIALS USAGE CHART
CONTRACT
OCT 1968
SCALE AS SHOWN
1960-DM8-97/1



(1) EXCAVATION AND COMPACTED QUANTITIES ARE THOSE REMAINING AS OF AUGUST 1972 FOR COMPLETION OF THE MARCH 1972 REVISED EMBANKMENT SECTION.

(2) CONSISTS OF APPROXIMATELY 50,000 C.Y. OF STOCKPILED MATERIAL PLUS APPROXIMATELY 50,000 C.Y. OF MATERIAL REMAINING IN THE FIRST STAGE COFFERDAM.

(3) ASSUMED SUITABLE FOR RANDOM ROCKFILL (QUARRY RUN) OR SUITABLE TO BE PROCESSED FOR SELECT ROCKFILL.

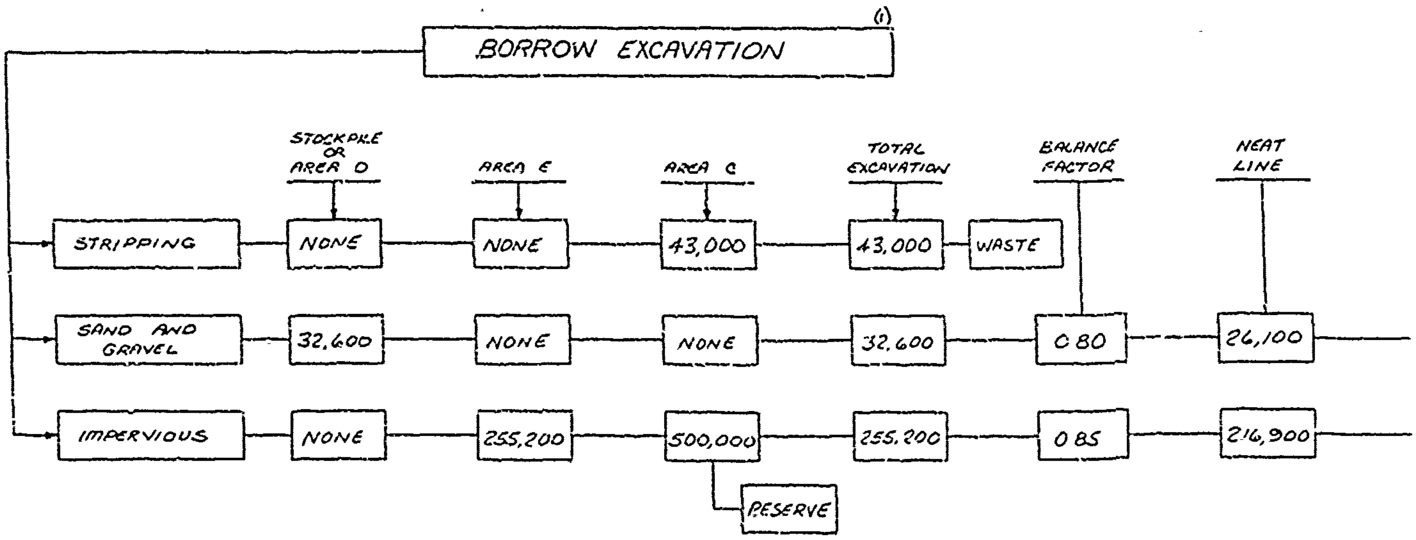
(4) PRODUCTION OF SELECT ROCKFILL ESTIMATED AT APPROXIMATELY 50 PERCENT OF EACH YARD PROCESSED.

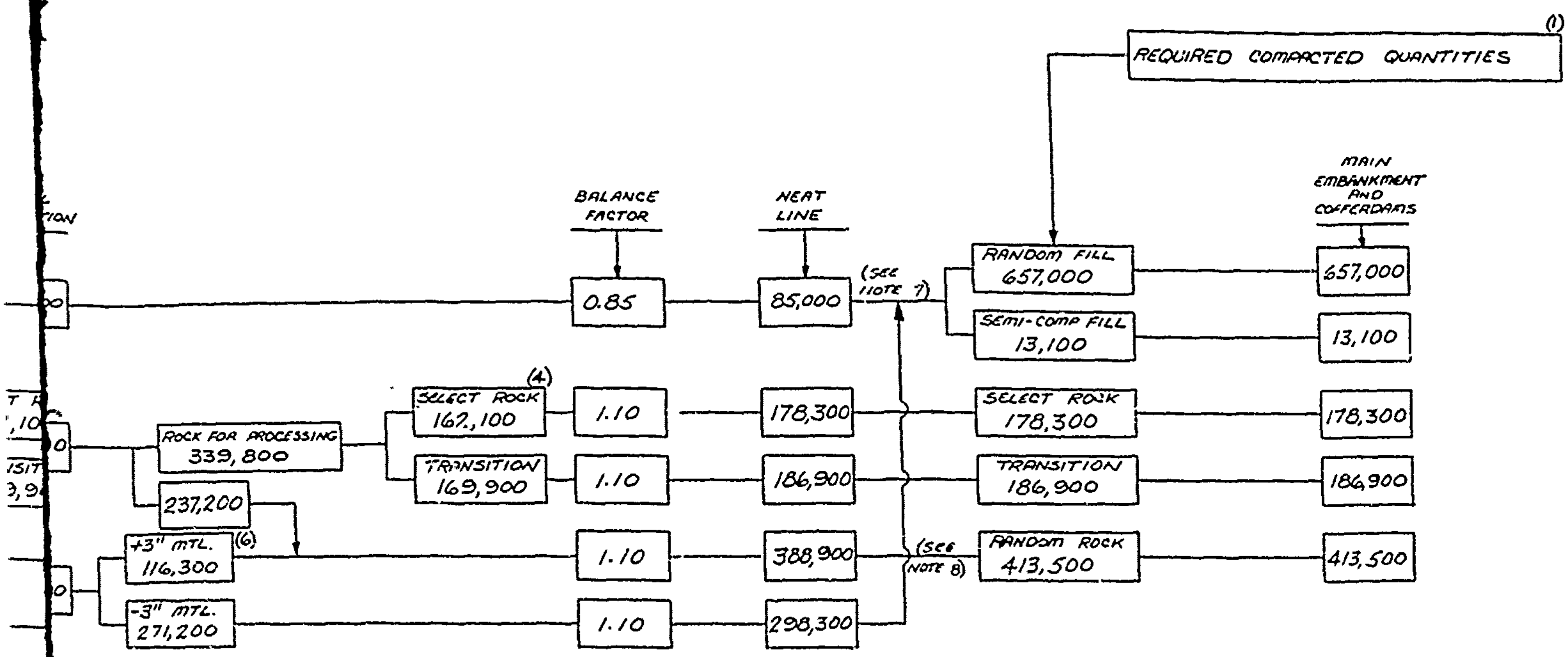
(5) CONSISTS OF MATERIAL UNSUITABLE FOR PROCESSED SELECT ROCKFILL OR UNSUITABLE FOR QUARRY RUN RANDOM ROCKFILL OR RANDOM FILL.

(6) PRC

(7) APF
FRC

(8) NEE
EXC

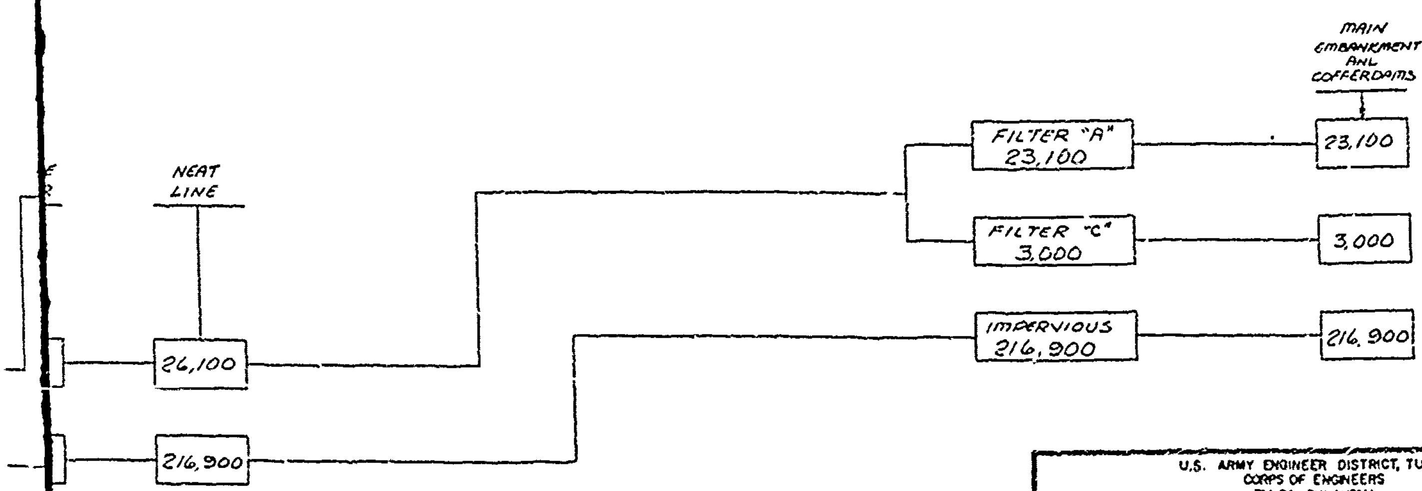




(6) PRODUCTION OF RANDOM ROCKFILL ESTIMATED AT 30 PERCENT OF EACH YARD PROCESSED.

(7) APPROXIMATELY 337,000 C.Y. OF EXCAVATED RANDOM FILL MATERIAL TO BE OBTAINED FROM BORROW AREA "E" AND SURROUNDING AREAS IN THE RESERVOIR.

(8) NEED FOR ADDITIONAL ROCK BORROW WILL BE DETERMINED AFTER SPILLWAY EXCAVATION IS NEARER COMPLETION.



U.S. ARMY ENGINEER DISTRICT, TULSA
CORPS OF ENGINEERS
TULSA, OKLAHOMA

RED RIVER WATERSHED — SALINE RIVER, ARKANSAS

DIERKS RESERVOIR
EMBANKMENT AND SPILLWAY
MATERIALS USAGE CHART
AUGUST 1972

DESIGNED David Wright
DRAWN K Leland
CHECKED David Wright
SUBMITTED J.D. Brown for
CHIEF, SOILS MECH. SEC.
DATE MARCH 1972

SCALE AS SHOWN | SUPPLEMENT #2
DRAWING NO. 1960-DM8-97/18